PROCEEDINGS

OF THE

TENTH ANNUAL MEETING

OF THE

Florida State Horticultural Society

HELD AT

ORLANDO, FLORIDA,

May 4, 5, 6 and 7, 1897.

COMPILED BY THE SECRETARY.

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Wright, Miss N. M., 314 W. Duval St., Jacksonville,
Wyeth, J. H., Winter Park,

397 members this yr

CONSTITUTION.

ARTICLE 1. This organization shall be known as THE FLORIDA STATE HORTICULTURAL SOCIETY and its object shall be the advancement of horticulture.

ART. 2. Any person may become a Member of the Society by subscribing to the Constitution, and paying one dollar. Any person may become a Life Member of the Society by subscribing to the Constitution and paying ten dollars.

ART 3 Its Officers shall consist of a President, three Vice-Presidents, Secretary, Treasurer and Executive Committee of three, who shall be elected by ballot at each annual meeting. After the first election, their term of office shall begin on the first day of January following their election

ART. 4. The regular annual meeting of this Society shall be held on the second Tuesday in April, except when otherwise ordered by the Executive Committee

ART. 5 The duties of the President, Vice-Presidents, Secretary and Treasurer shall be such as usually devolve on those officers The President, Secretary and Treasurer shall be, *ex officio* advisory members of the Executive Committee.

ART 6. The Executive Committee shall have authority to act for the Society between annual meetings

ART 7. Sec. 1. The Constitution may be amended by a vote of two-thirds of the members present

ART. 7. Sec. 2. An amendment to the Constitution and By-Laws shall be proposed at one Annual Meeting and voted on at the next Annual Meeting unless unanimous consent is given to its immediate consideration.

BY-LAWS.

1. The Society year shall be co-extensive with the calendar year, and the annual dues of Members shall be one dollar.

2. All bills authorized by the Society or its Executive Committee, for its legitimate expenses shall be paid by the Secretary's draft on the Treasurer, O. K.'d by the President.

3 The meetings of the Society shall be devoted only to Horticultural topics from scientific and practical standpoints, and the Presiding Officer shall rule out of order all motions, resolutions and discussions tending to commit the Society to partisan politics or mercantile ventures.

PROCEEDINGS

OF THE

TENTH ANNUAL MEETING

OF THE

FLORIDA STATE HORTICULTURAL SOCIETY.

The tenth annual meeting of the Florida State Horticultural Society was held at Orlando upon the invitation of the Board of Trade of that city. The Society convened in the Opera House on Tuesday May 4th, 1897, at 7:30 o'clock P. M., in accordance with the programme as published, and adjourned, sine die, on Friday following, at 11:30 A. M. About 225 members were in attendance, and the meeting was one of the most interesting that has been held by the Society.

MINUTES.

In the minutes, which follow, all the events and transactions of the meeting are given, in condensed form, in the order of their occurrence; the addresses, papers, discussions, reports, and other matters of general interest or special importance, are simply noted, and appear in full under appropriate heads in the body of the volume, and may be readily referred to by turning to the page given in connection with each below.

For addresses of members (which are not given below) see "List of Members."

FIRST DAY.

EVENING SESSION—OPENING SESSION.

Tuesday, 7:30 P. M.

1. Call to order by President Taber.

2. Prayer by Right Rev. Wm. Crane Gray.

3. Address of Welcome, Hon. W. L. Palmer, of Orlando, (see "Address of Welcome," page 6).

4. Response to the Address of Welcome, Dr. D. O. Davies, (see "Response to Address of Welcome," page 8).

5. On motion of Mr. Hubbard, W. S. Hart and H. G. Hastings were authorized to act as Associate Secretaries during the meeting.

6. President's Annual Address. (See "President's Annual Address," page 11).

7. By request, the Secretary's Annual Report was deferred until the following morning.

8. By request, the Treasurer's Annual Report was deferred until the following morning.

9. Report of Special Committee on Local Arrangements, Geo. H. Wright. (See "Report of Committee on Local Arrangements," page 23).

SECOND DAY.

MORNING SESSION.

Wednesday, 9:30 A. M.

10. Called to order by the President.

11. Secretary's Annual Report, A. H. Manville, (see "Secretary's Annual Report," page 16).

12. Report of Acting Secretary, G. L. Taber, (see "Report of Acting Secretary," page 17).

13. By request further time was granted the Treasurer in making his annual report.

14. Annual Report of the Executive Committee, E. S. Hubbard, Acting Chairman, (see "Annual Report of the Executive Committee," page 21).

15. On motion the report of the Executive Committee was adopted.

16. Standing Committee on Nomenclature called. Paper read by Mr. E. S. Hubbard, Chairman, (see "Report of Committee on Nomenclature," page 77).

17. The Committee on Catalogue not being ready to report, it was moved by Mr. Bacon that the time allotted to report of Catalogue Committee be placed at the disposal of Messrs. Reasoner and Meade for their papers. Carried.

18. Standing Committee on Ornamentals. Paper read by E. N. Reasoner, Chairman, (see "Ornamentals for Florida," page 51).

19. Special paper on Orchids, T. L. Meade, (see "Orchids," page 38).

20. Mr. Meade suggested that on account of the many technical terms used and the great length of his paper it might be well for the Society to publish only a synopsis. On motion the paper was ordered published as read. (See remarks following Mr. Meade's paper, page —).

21. Committee on Citrus Fruits called. Paper read by Arthur H. Brown. (See "Report of Committee on Citrus Fruits" page 24).

22. Under topic of Citrus Fruits a resolution as to "Best Methods in Future Freezes" introduced by Mr. Bacon. (See "Best Methods in Future Freezes," page 26).

23. Under topic of "Citrus Fruits." Discussion following the reading of Mr. Bacon's resolution, (see "Best Methods in Future Freezes, page 26).

AFTERNOON SESSION.

Wednesday, 2:30 P. M.

24. Call to order by President Taber.

25. Invitation to the Society to visit the grove of Lieut. G. L. Dyer read by the Secretary.

26. Invitation to attend the exhibition of the Orlando Public School, of their work in Botany, read by the Secretary.

27. Moved that discussion of Citrus Fruits be taken up. Motion lost.

28. On motion every speaker in a dis-

cussion was required to confine his remarks to five minutes.

29. A motion that a further discussion of Citrus Fruits be deferred to some future time was lost.

30. A motion that we proceed at once to the discussion of Citrus Fruits was carried.

31. No remarks being made at this time on Citrus Fruits, it was moved and carried that the Society proceed with the regular order.

32. Report of Standing Committee on Diseases and Insects of the Citrus by Prof. H. J. Webber, (see "Notes on Orange Diseases," page 69).

33. Reading of letter from Mr. Hubbard, by Prof. Webber, (see "Interesting Observations in Mexico, California, and New Mexico," page 73).

34. Under topic, "Notes on Orange Diseases." Discussion following Prof. Webber's paper, (see "Notes on Orange Diseases," page 69).

35. Under topic "Notes on Orange Diseases." Discussion. (See "Blight and Red Scale," page 75).

36. Standing Committee on Peaches and Plums called. Paper by Walter Cooper, (see "Profitable Peach Growing in South Florida," page 83).

37. Discussion under topic "Peaches and Plums." (See discussion following "Profitable Peach Growing in South Florida," page 86).

38. Paper by Prof. Walter T. Swingle. (See paper on "Lemon Culture," page 33).

39. Standing Committee on Pears and Apples called. No report.

40. Standing Committee on Figs called. No report.

EVENING SESSION.

Wednesday, 7:30 P. M.

41. Call to order by President Taber.

42. Mr. O'Neal of the Orlando Board of Trade extended an invitation to the Society to attend an excursion to Lake Charm and Rollins College tendered by the Board of Trade.

43. Moved by E. S. Hubbard that the catalogue as adopted by the Executive Committee be adopted by the Society as its official catalogue. Carried.

44. Annual election of Officers. (See "Election of Officers," page 130).

45. Resignation of Secretary Manville accepted. (See remarks under "Election of Officers," page 130).

46. H. G. Hastings elected to fill out the unexpired term of Mr. Manville.

47. The Committee on Final Resolutions was instructed to express the Society's appreciation of Mr. Manville's services. (See remarks under "Election of Officers," page 138).

48. Orlando Selected as Place of Next Meeting. (See "Place of Next Meeting," page 129).

49. On motion the President was instructed to place a Forestry Committee on the next programme. (See "Forestry Committee, page 116).

50. Paper by Prof. H. J. Webber, The New Art of Warfare Against Scale Insects. (See "New Art of Warfare Against Scale Insects," page 53).

51. Committee on Tropical Fruits called. Paper on Pineapples read by Geo. I. Russell. (See Paper on "Pineapples" page 58).

52. Under topic of Tropical Fruits, discussion, (see remarks following Mr. Russell's paper on "Pineapples," page 61).

53. By Mr. Price, greetings from the

Lake County Horticultural Society to the Florida State Horticultural Society. (See "Special Resolutions" page 139).

THIRD DAY.

MORNING SESSION.

Thursday, 9:30 A. M.

54. Call to order by President Taber.

55. Dr. Davies called to the chair.

56. President Taber appointed H. W. O. Margery, Edward Winter and Lorenzo A. Wilson as a Committee on Final Resolutions. (See "Resolutions of Thanks," page 138).

57. Motion to make the President and Secretary voting members of the Executive Committee. (See remarks following report of Executive Commitee, page 122).

58. Motion for reconsideration of adoption of catalogue carried and was made the special order for 11 o'clock.

59. Announcement by Mr. Gore that he had received a number of packages of insecticide from Dr. Montgomery for distribution among the members of the Society.

60. A vote of thanks was extended to Dr. Montgomery for his kindness. (See "Resolutions of Thanks," page 138).

61. Standing Committee on Grapes called. Paper on Grapes read by C. A. Bacon, (see Paper on "Grapes," page 88).

62. Under topic of Grapes, paper prepared by O. R. Thacher and read by the Secretary. (See "Grapes in South Florida," page 90).

63. Under topic of Grapes, remarks by J. B. LaMontagne on Experiments with Foreign Grapes in Florida. (See "Foreign Grapes in Florida," page 92).

64. By request Mr. Bacon brought up the subject of Figs. Remarks by Mr. Bacon, Mr. Emmons, Dr. Kerr, and Mr. Hart. (See "Figs," page 105).

65. On motion discussion of the catalogue was deferred until 7:30 P. M.

66. Special Committee on Legislation Against Fruit Pests called. Report made by Prof. Rolfs who preceded the reading of the Bill by explanatory remarks. (See "An Act for the Control and Extirpation of Diseases and Insects of Agricultural Products of the State of Florida," page 111.

67. Under above topic, discussion. (See remarks following "An Act for the Control and Extirpation of Diseases and Insects of Agricultural Products of the State of Florida," page 114).

68. Report of Committee accepted and Committee discharged.

69. Standing Committee on Strawberries and Miscellaneous Fruits called. Paper on "Strawberries in Florida" read by B. H. Alden. (See "Strawberries in Florida," page 107).

70. Standing Committee on Kaki called. No report.

THURSDAY AFTERNOON.

No session of the Society was held during the afternoon, the members enjoying the excursion tendered by the Orlando Board of Trade, to Rollins College, Winter Park and Lake Charm.

THURSDAY EVENING.

71. Called to order by President Taber.

72. Dr. E. E. Pratt called to the chair.

73. Resolution to lay over the reconsideration of the adoption of the catalogue until the next annual meeting was carried.

74. Resolution condemning the present free distribution of common varieties of garden and flower seeds by the Agricultural Department of the United States

carried. (See "Special Resolutions," page 139).

75. Special Committee on Necrology called. Report made by Dr. E. E. Pratt. (See "Necrology" page 131).

76. Under topic of Necrology. Eulogistic remarks on the life of Mr. C. F. A. Bielby were made by Mr. Westlake. (See "Necrology," page 135).

77. Under topic of Necrology. Eulogistic remarks on the life of Dudley W. Adams by Messrs. Wright, Hart and Bacon. (See "Necrology," page 136).

78. On motion the resolutions offered by the Committee on Necrology were adopted.

79. Resolutions of respect to the memory of Dudley W. Adams from the Lake County Horticultural Society were read and accepted. (See "Necrology," page 131).

80. Resolutions of sympathy and condolence to the Rev. Lyman Phelps adopted. (See "special Resolutions," page 131).

81. Special paper on Experiments Conducted at the Sub-Tropical Laboratory in the Origination of New Varieties of the Orange, Pineapple and Guava by Herbert J. Webber and Walter T. Swingle. Paper read by Prof. Swingle. (See "Experiments in the Origination of New Varieties of Orange, Pineapple and Guava," page 119).

82. Under above topic, discussion. (See "Guavas," page 123).

83. Standing Committee on Fertilizers called. No report.

84. Standing Committee on Entomology called. Paper by Prof. P. H. Rolfs on Injurious Insects of the Year. (See "Injurious Insects of the Year," page 94).

85. Under above topic, paper by Prof. P. H. Rolfs, Insect Diseases. (See "Insect Diseases," page 98).

86. Annual report of Treasurer, W. S. Hart. (See "Treasurer's Annual Report," page 19).

87. Report of Committee on Final Resolutions. (See "Resolutions of Thanks," page 138).

FOURTH DAY.

FRIDAY MORNING.

Friday, 9:30 A. M.

88. Call to order by President Taber.

89. Discussion of Citrus Fruits called up but on motion was deferred until after the regular order had been disposed of.

90. Moved that the meeting adjourn at 11:30 A. M. Carried.

91. Standing Committee on Marketing called. No report.

92. Under topic of Marketing, remarks by Valentine E. F. Taylor. (See page 128).

93. Standing Committee on Vegetables called. Remarks by Mahlon Gore, Chairman. (See "Vegetables and Transportation," page 124).

94. Under topic of Vegetables, discussion. (See "Vegetables and Transportation," page 126).

95. Paper of B. F. Clayton on Ramie referred to Executive Committee for decision as to publication.

96. Under topic of Citrus Fruits, discussion. (See "General Citrus Discussion," "Cleft Grafting and Winter Budding," "Best Methods in Future Freezes" and "Foot Rot." Page 62).

97. Adjourned Sine die.

ADDRESS OF WELCOME.

HON. W. L. PALMER, ORLANDO, FLA.

[SEE MINUTES PAGES 1 TO 5, ITEM 3.]

Mr. President, Ladies and Gentlemen of the State Horticultural Society: I am commissioned by the Mayor of Orlando, its Board of Trade, and its good people generally to meet you at the very beginning of your session, and extend to you a welcome at once earnest and cordial. I beg sir, that you, and the body of good people you represent will not discount that greeting because it is borne to you by an Attorney, for I assure you, that neither fee nor retainer shall be charged you if you will accept that greeting in the same spirit in which it is extended.

Let me have, as it were, the hand of every member of this society, not in a three-fingered, perfunctory touch, but in a warm, earnest grasp, that shall at once put each of you in full and sympathetic touch with us and our people. We have looked forward to your coming with no small degree of pleasurable expectation. We recognize in your body that elect few who are devoting the best endeavors of head and heart in evoking from Nature her richest beneficence for the good of mankind. Other conventions have met in this hall, and having promoted a fortunate few to places of honor and trust, adjourned. Your coming means the promulgation of correct theories and the triumph of practical ideas that affect the living and the homes of the people. Your coming is not announced by flare of trumpet and the bray of the demagogue, but with that humility of intelligent and unselfish investigation that seeks the common good of mankind. Nature always locks her richest treasures from the laggard and indolent; her most precious secrets are never revealed, except to the earnest, inquiring mind. Your coming is not for one another or special promotion, but for the universal good, and in honor preferring one another.

That plain farmer in South Georgia, who, after patient and earnest investigation and repeated experiments, developed the "Elberta" peach, christened it with the name of his devoted wife, and sent it forth to gladden the eye, and bring good cheer to the appetites of mankind, may not be known to the world as a hero; he may remain unhonored, unwept and unsung, but, Mr. President, to my way of thinking, that man is a grander citizen and a greater benefactor than the Czar of all the Russias, who backed by an army, today supports the unspeakable Turk in atrocities that shock the conscience of the world. (Cheers.)

Dudley W. Adams, whose life was spent among his trees, his flowers and his vines, where he lived close to the heart of Nature, was a greater benefactor to our people—his life was worth more to the State of Florida, than some of her sons on whose brow she has put the crown of honor, and into whose hands she has given promotion.

I would not seem to be wanting in pa-

triotic sentiments, but I say, sir, without fear of successful contradiction, if I have read your published programme aright and if I have a correct appreciation of the men who will discuss these important topics, the material good of Florida will get more lasting results from your session than the present Florida legislature now promises. You at least have this advantage, you know what you want, and you are united; they do not seem to know what they want, and they are united on nothing. You see we are not entertaining angels unawares. We, at least, have a high appreciation of your body and its work and its objects; we recognize in you the advance agents of Florida's prosperity; we recognize in you the kindergarten, the high school and the university for every man, who would get the best results from his field, his garden and his vines. Nature abhors an imitator; you can not sham when you are seeking good returns from her lap; she knows the real farmer from the imitation.

Let me say in passing, that the prosperity of this State, the prosperity of no state can come from statutory enactments. It is reported that some years since a proposed statute was introduced by one of our average solons, that, "Whereas the scale insect and the Red Spider are injurious to the orange industries of this State, therefore be it enacted, that such insects shall be prohibited and forbidden to come into the State." (Laughter.)

Gentlemen of the Society, we, at least, should appreciate this fact, that no single crop, no single monied crop ever made a State prosperous. A single monied crop unbalances the wisdom of a general husbandry, and in the end is a curse and a despot. I came from Georgia, and I am not ashamed of it. In that state—in every state—where cotton was king, poverty prevailed, but where cotton was grown amidst a diversified agriculture, it was the crown of a general prosperity.

Among the most important things let this be among the questions that must address itself to the thoughtful mind of the people before me tonight. One of the most threatening dangers in this country is the loss of our country and village population that drifts to the larger cities of this Republic. Fifty years ago only one-twelfth of the people of America lived in cities of over 8,000 inhabitants; forty years ago one-eighth of the people lived in cities of over 8,000 inhabitants; thirty years ago, one-sixth; twenty years ago, one-fifth, and today nearly one-third. Bear this in mind, that the village and the country are the sources of the strength of this Republic. The men, who have guided its destinies have not come from its cities, but from the country where they drew their strength from the earth and the ruggedness of Nature about them. Washington and the other men, who started this Republic, and who have defended it—was a farmer; Thomas Jefferson was a farmer; Henry Clay learned the philosophy of a straddling compromise in riding to mill astride a sack of corn on a mule, Lincoln, than whom this country has produced no greater citizen, a man in whom the Puritan and Cavalier beautifully blended, learned that ruggedness of character and self reliance, splitting rails in a forest of Illinois; while Grant— a few days ago the world stood the second time at his bier—left his wagon loaded with potatoes to attend a town meeting to organize a company to fight in the war of the States. It is to such societies as yours we must

look in arresting this dangerous tendency of the hour. So long as the homes of this country are covered by mortgages, the bull dog of obligation, they cannot flourish; and so long will horticultural and agricultural interests lag, but when they have organized and put these questions to the front—and I know of no greater power than these organizations—then will you have less complaint about labor and capital and poverty throughout the country. (Cheers.)

It is a question to us, not so much the golden standard, but the most prolific pea, the best pineapple and the question of the larder; it is not to us so much the question of free silver as what will prevent the foot rot in orange trees and adapt tobacco to Florida soil. (Cheers.) It is not in my judgment the shifting scale of a Dingley tariff, but reduced rate of taxation and better roads in this country.

Mr. President, pardon me if I am out of the beaten route in extending to you this welcome; if I am betrayed into too great a digression, it is because we place a high value on your coming, and because we appreciate the scope of your investigations. In February, 1895, when the people of South Florida awoke one morning and found fifty million dollars of property burned while they slept; when they saw the loss of the work of a lifetime, their hearts sank within them; when they looked sadly upon the desolation about them and it seemed no hope could relieve, it was from your society the words of good cheer came, saying to us; "Though you stand in the presence of your dead before long these dry bones shall live again." (Cheers.) We welcome you in the orange and fruit belt of this peninsular; we have followed your suggestions and our orange groves promise a generous return in the near future. You should feel at home here and we are delighted to have you come that we may take counsel together, for in the multitude of counsel there is wisdom. You will like us; I have no doubt about it, because we shall like you. If our people elbow you too closely and smile on you familiarly, they are not trying to sell you a corner lot; they only want you to know you are in the arms of your friends.

We beg you to feel entirely at home, and if you leave the blessings you have promised by your coming, we shall carry out the divine injunction, and go a day's journey when you leave us.

RESPONSE TO ADDRESS OF WELCOME.

BY D. O. DAVIES, OF FERNANDINA, FLA.

[SEE MINUTES PAGES 1 TO 5, ITEM 4.]

(Dr. Davies was cordially greeted by the audience with much handclapping; and his address was punctuated all through with frequent bursts of laughter and applause.)

Mr. President, Ladies and Gentlemen: I thought myself happy in being the representative of our Society making response to the admirable Address of Welcome to which we have listened with so

much pleasure. I did think myself fortunate in this honor, but am not so certain now. The orator's palmary eloquence makes me pause. A fear begins to rise that perhaps the response may seem so inadequate to the welcome—so far below the occasion and the environment, that you may not feel as much like clapping hands when I sit down as you kindly did when I arose.

The honorable gentleman who welcomed us, near the close of his address told us of their great pleasure—"we are glad to have you among us." Mr. President I can say, we are glad to make them glad, and will gladly share their gladness as we come among them with glad hearts for that very purpose tonight. We come with pleasure to what I may call the Queen City of the peninsula. (Applause.) She sits here upon her throne; in many respects singular, but most singular in that best of all things, the perfection, as I understand it, of the climate of Florida. I know no place for invalids equal to this. You have in many respects carried your city to the high places of excellence, its buildings, its public illumination, its waterworks, but I think perhaps beyond all these, is what we have a sample of here (referring to the pineapples on exhibition). I was hoping we would find them very large and very yellow, and wanted the Society to know how fine they are and pass judgment on them, and there would be a great many of them. That apple reminds me about Troy—wasn't it the golden apple that caused trouble in Troy? We have the apple here; I do not think it will cause much trouble here and with us. As to the culture of the pineapple, however, the season is just commencing; I suppose that is pretty good for a beginning. I was hoping we would come in the mid-season of the pineapple.

I was particularly struck with one statement of the speaker representing the community. It was very warm. I sat there and imagined the hand of our Society extended to him. It was the whole Society put together. It was no cold and perfunctory grasp. And I looked at his slender fingers and wondered how he was going to get around that big hand of the Society. But again "if we found they were crowding us"—if it were the unmarried men, they might corner as much as they please; but he said further, "If you find our arms tight around you," I began to think, "What will Mrs. Davies say?" A lady friend of mine attended a Sunday school convention in DeLand. She was a lovely woman and a very bright woman. She was talking about the warmth of the reception there, and said: "Oh, Doctor, they just received us with open arms." I asked, "Was your husband there Ma'am?" "O, I don't mean that, it was—er—it was intended metaphorically." (Laughter.) And I suppose Mr. Palmer means it that way, and as such we take it, and with genuine pleasure enjoy it. We expect to enjoy ourselves hugely.

Mr. Palmer has set the key note very high. If we realize all he said we can do and ought to do, it will indeed be a very profitable session. We have begun aright. I wondered when I came in, how are we going to begin. Sitting here we had time to think about the beginning; and I was reminded of a man who went into the pantry to get some canned goods—very rare in Florida. (Laughter.) His wife heard him making a great fuss and some exclamations. She said: "John, what are you doing?" Said he: "I am opening this

can of peaches." "What are you opening it with?" "I am opening it with this knife, what do you think I am opening it with?" "I thought from the tones you were opening it with prayer." (Laughter.) So we opened our session with prayer. I am a young fellow and the fun is not out of me yet.

I pictured those clouds dropping fatness and the corn laughing in the valleys, and I did hope the Bishop's prayer would be answered, and the fatness would come down and we should have the opportunity of rejoicing together in large harvests yet to come, the corn and we laughing together. I was hopeful, born that way. I think every Christian man ought to be optimistic. I have no sympathy with pessimists under any circumstances. I came here five or six years ago. Four physicians had stood around my bed in Kentucky; they did not know I could hear, thought I was unconscious. One said, "I don't believe he can live any how;" and my dearest friend, who had been my family physician for 20 years and loved me like a brother, said: "Perhaps it would be better if he should die, he is only a wreck." That friend died the other day; two of those physicians are dead, and I am a pretty lively corpse. Thanks to Florida that I am what I am.

I am a little like that minister who was crossing the ocean. A storm came up, he had a good many qualms of conscience; been a good deal disturbed in feeling. He went up to the captain: "Captain is there any danger?" "No." "Bad storm?" "Yes." You know seamen are crisp and short; this was one of that sort, and he did not get much satisfaction there. After awhile the storm got worse. He went to the Captain, and said: "Captain, the storm is getting worse." "Yes, I see it is." "Do you think there is any danger of our sinking?" "I don't know." He took him to a skylight to look down. "You see those men, what are they doing?" "They are playing cards and cursing and swearing at a great rate." "Now they are old seamen, if there was any danger of the vessel going to the bottom do you think they would be cursing and swearing at that rate?" "No sir, I suppose not, they would be saying prayers." He said, "You may feel safe." "Thank you," said the preacher. The captain went off and thought that would be the last from that man. The storm got worse and worse, the preacher's conscience troubled him more and more; after awhile he thought they were going down, and he went to the place and looked down, and said: "Thank God, they are playing cards and cursing and swearing yet, they are at it still." (Great laughter.) Well as I came up the road I saw them yonder in the field cutting away at the sprouts, sticking in the buds, just showing they were determined. The last two years nearly I have been observing, and I just feel like that good man, "Well, 'they are at it yet,' not going to give up." The cold certainly did vast injury; but I was delighted to see the extent of the improvement; fine groves coming up in different sections, real trees, real groves; and I was very much encouraged. So I can cordially respond to my friend's speech.

He welcomed the ladies, saying "Mr. President, Ladies and Gentlemen." We have ladies in our Society, and they are largely, sir, engaged in the nursery business, as is quite proper. (Laughter.) I have been corresponding with one lady, who is in the nursery business, and I am going to get some of her plants. So I

thought it was eminently proper she should have the first place in the orator's address, the place of honor next to the President.

However, seriously, I do not know whether or not I am making the right kind of speech. This is the first time I have had to talk for an agricultural society. (A voice, go on.) Thank you, that was only one lone voice, much obliged for that one friend. (Laughter and applause.) We came among you with the expectation, first of all, of devoting ourselves to our work that the first speaker so magnified. I agree with most that he said. I am not a politician, I do not know the party he belongs to, but I thought he was hitting the legislature pretty hard. They have done one good thing at Washington: They put a cent a pound tariff on citrus fruits. If they only do that and carry it through, and if Tallahassee will select men for the railroad commission, who while not oppressing the railroads, though perhaps some of them have oppressed us a little, and regarding as honorable men the equities of property and the rights of capital, yet will also insist upon and enforce the rights of labor, it will not be such a bad legislature after all. While it just so happens I am from Kentucky in Florida, it is an odd coincidence that those two states have been behaving themselves most outrageously on the senatorial question, Kentucky within one or two votes of an election, so near and yet so far. And so it has been here, not yet quite so near as in Kentucky; let us hope that the question may be settled soon and that then they will give themselves in the limited time remaining to providing means for the development of the real interests of the state.

As to this diversified productiveness, there is no limit unless capital should become alarmed, but I see no limit to the progress of this state; its prosperity ought to be commensurate with its magnitude; it is greater than New York, the Empire State, greater, that is, in territorial extent.

After asking your indulgence, and after thanking my one friend over there, and repeating my hearty response to this note of welcome from feeling hearts, that we are all glad to be with you, glad to enter into association with this Queen City of the peninsula, and I hope my friends, you whom Mr. Palmer represents, may be as ready to say as pleasant things of us when we go as when we came. I thank you. (General applause and laughter.)

PRESIDENT'S ANNUAL ADDRESS.

GEO. L. TABER.

[SEE MINUTES PAGES 1 TO 6, ITEM 6.]

Members of the Florida State Horticultural Society, Ladies and Gentlemen: We meet today with hearts bowed down in grief. Our late lamented President, Dudley W. Adams, who for nine years so ably piloted us through sunshine and through storm, has himself reached the final port, and we are left to mourn the loss of the only captain that we ever knew.

His was a heart that pulsated in true

unison with the great heart of Nature, and what more fitting than, when the short sharp summons came, it should find him working amongst the trees and flowers that he loved so well.

With no time to say good-bye to them or us, he passed from among us; but, during their existence, those flowers shall offer up their perfumed tribute, and, for many years, those trees shall stand as living monuments to his memory; while, to us, the Florida State Horticultural Society, he has left a heritage—a heritage that we shall keep and cherish always—the goodly heritage of his name and fame.

The sad inroad made in the Officials of this Society, since our last meeting, by the grim reaper, Death, has not been confined to the Society's Chief Executive, but we are also called upon to mourn the loss of another honored Officer, in the person of C. F. A. Bielby, of the Executive Committee, and also a prominent Ex-Official in the person of O. P. Rooks.

It is, perhaps, outside the province of your President, to assume to himself the sad duties that devolve upon your Committee of Necrology, and these duties I shall not attempt to infringe upon, but I cannot refrain from bearing tribute in a few words, to the high esteem in which these Officers and this Ex-Officer of the Society were held. Surely in the death of Messrs. Adams, Bielby and Rooks, we have, in each instance, an exemplification of the adage, "Death loves a shining mark." Their names are inseparably connected with the growth of Florida Horticulture, and with the annals of this Society. Each has done ardent, active and efficient work toward the advancement of Horticultural knowledge, both in writing and practice, and each will be sadly missed from the deliberations of this Society.

To the families of these, as well as the families of all our other deceased members, your Committee on Necrology will bear due tribute of our sense of loss, and whatever of comfort may be derived from our sympathy.

I feel it due to the Society, as well as to myself, to call your attention, in a few words, to the dual official capacity in which circumstances have seemed to combine to force me to act for the past eight weeks.

On the 8th of March, your Secretary, A. H. Manville, was obliged to lay aside all duties connected with the Secretaryship on account of ill health, and, with this meeting so near at hand, it seemed something of a problem as to how the work pertaining to the Secretaryship was to be effectively carried on during the interim.

As is always the case during the few weeks immediately preceeding our annual meeting, there was a great deal of work in sight, and it was feared that any attempt to install a new Secretary—however efficient—would make a serious break in the Society's work; on account of the time liable to be involved in the acceptance of the appointee; the transfering of the Society's records and effects; and the acquaintanceship with Society matters and methods that would have to be acquired by the incoming Secretary. I, therefore, wrote to the Chairman of your Executive Committee offering to carry on the Secretary's work up to the time of this meeting, if the Executive Committee so desired; which offer was accepted. Whatever work I have since done in the rather anomalous position in which I have been placed, has been freely done, and, in bringing this

matter to your notice, it is not with the object of taking to myself credit for work performed, but rather that the attendant circumstances might prove an excuse—if any is needed—for work that, in the ordinary course of events, might, perhaps, have been better performed.

Referring further to the resignation of the Secretaryship by Mr. Manville, I would state that though this resignation was placed in my hands on March 8th, no official action has been taken upon it.

I am very glad to state that Mr. Manville is able to be in attendance at this meeting (which at one time appeared doubtful), and that he will make the Secretary's Report for the past year in person.

Whatever action this Society may see fit to take upon his resignation can perhaps be better decided upon after this report is made, but, I am sure that the Society will, in any event, see fit to recognize, in some appropriate manner, the great amount of arduous work that he has performed for it, both as one of its founders, and, for the past three years, as its Secretary.

It has sometimes seemed to me that, in the narration of our horticultural experiences, we are apt to lay too much stress upon our successes and to forget to say anything about our failures. It is undoubtedly very nice and tending to redound to our own personal credit to be able to say that we did so-and-so, and achieved such-and-such, magnificent results; but, would not the educational purposes, to which this Society lays claim, be equally well or better subserved, if we would oftener point out the wrong roads, we have individually traveled, as well as those we deem to be the right ones.

I speak advisedly when I say "those we deem" to be the right ones, for there are often several roads that trend in the same general direction, either of which—though some more round-about than others—may be followed, and bring us, finally, to the same objective point. But, a wrong road —one that we have tried and proved to be wrong—is one that is continually leading us farther and farther from the desired goal.

One of the wrong roads that many of us have traveled, and one that I believe is not often enough pointed out, is the road of Inadaptation. It lies in the planting of trees and plants that were never intended by Nature for the locations in which we place them. The practice of our art, in the way of experimentation, is laudable and in every way commendable, if we will but recognize Nature's boundary limits of adaptability, however ill defined. But, when we overlook or ignore these, and attempt, by the practice of sheer art, to overrule or supplant the decrees of nature; she laughs at us and mocks us. If we approach her in humble spirit and ask her to disclose to us her secrets, she tells us that some of her laws are inscrutable, and may not be divulged. But, that this great primal lesson of adaptability is one that she has tried to teach to all humanity, throughout all the ages, and in all the zones. It is written in the growths that she has placed upon the banks of her water courses, and on her sandy plains, and on her mountain sides, and in her fertile valleys, and in her nearly sterile deserts, and she says to us: go forth and read. She points out to us, that in the planting of her different seeds, she placed them with a full

knowledge of the wants of each; with due regard for drouth and moisture, and for heat and cold; and she quotes to us the trite maxim: "If ye would be apt scholars, ye must be careful students."

She tells us that, in the practice of our art, we may enlarge her teachings if we will but recognize her fundamental truths; that she will assist us if we but acknowledge her supremacy; that one of her edicts is this law of adaptability, which, while we may never fully understand, we must recognize.

Another wrong road which some of us have followed almost to the point of disaster lies in too thick planting. It looks like such a waste of ground to cultivate five, or twenty, or fifty, or one hundred acres, with the small trees planted only at such maximum distances as our better judgment sometimes tells us that the large bearing trees should occupy; and we say, we will set them out two or three times as thick as this; and, when the young trees have served their purpose by having shaded the ground and each other, and borne enough fruit to pay for the whole orchard, we will dig up and throw away the surplus ones, leaving the remainder at a proper distance; and we will be that much ahead. But, will we be that much ahead in fact, or only apparently so? A man's pocket book may sometimes show an increase that is the result of short-sightedness in his business; and, and for which, his business, in the future, has to suffer out of all proportion to the temporarily increased bank account.

In fact, I believe the very terms of the proposition, as indicative of benefit to be derived from trees "shading the ground and each other," to be fallacious. If the trees have distance enough and are allowed to do so, they will shade themselves; each one, with its low, wide spreading branches, will form a perfect protection for its own trunk and larger limbs, both from a too torrid sun; and, to a large extent, that opposite degree of temperature that occasionally sends us shiveringly forth at unseemly hours of the night to anxiously scan the heavens and the thermometer.

In addition to properly protecting themselves, each tree, if it has room and is allowed to do so, will sufficiently shade the ground to an extent equi-distant with its breadth of top; and, beyond this, in the "middles," as we call them, a growth of some nitrogen catching plant, like beggar weed, will not only form a better shade than the surplus trees would do, but will, also, when plowed in, in the fall or winter, add materially to both the fertility and mechanical texture of the soil; and, if we may use such an expression, serve as a bank account for the roots to draw upon at their necessity.

In my remarks upon adaptability, I referred to the teachings of nature, and I believe her instructions to be of equal value in this matter of distances at which to plant.

Did you ever stop to think that, when, as a boy, you went in search of Nature's native fruits or nuts, the trees from which you obtained the largest quantity, and the finest quality, were those that stood more or less isolated from their fellows? Whether it was the American Chestnut in the North, or the Chincapin in the South; the sweet Acorns and Beech nuts of New England, or the wild Plums and Persimmons of the cotton belt;you invariably, although perhaps at the time unwittingly, heeded this great law of nature, that thick

planting is not conducive to the greatest degree of fruitfulness.

If, on the other hand, you want a straight, smooth pole, free from knots and side branches, you go to the thick wood, where each tree is crowding its neighbor, and all are climbing upward and still upward in the search for air and sunlight, and where each, vainly endeavoring to overtop and crowd out its neighbor, has sacrificed the secondary principle of reproduction, to nature's first God-given law of self preservation.

Did you ever see such a growth as I have just described, after the woodman had been through it and felled all but a few of the trees, leaving those more or less scattered; their long, straight trunks bared to the force of sun and wind and cold? Did you ever see such trees and pity them? I have.

Now, the condition of an orchard, planted too thickly, approaches, in a greater or less degree, the thicket which I have just described. As soon as each gets to crowd its neighbor, the lower side limbs begin to turn hard and brown and rusty and finally to die. The fruit becomes annually more and more confined to the top branches; annually poorer in quality; and annually harder and harder to get at. There is no room to get around with cultivator, or wagon, or spraying apparatus or ladders; and, if, finally, we summon courage to cut out the 50 to 75 per cent of trees that never should have been planted, the remainder still have to be trimmed of their dead lower limbs, and twigs; leaving long trunks exposed to sun and cold, and every tree protesting, as vigorously as anything inanimate can protest, against the weakened condition we have placed them in, and the false shape we have forced them to assume; as a result of our own short-sightedness and folly.

There are many other wrong roads, which some of us have followed to a greater or lesser extent; such as the roads of improper fertilization, and ill-advised pruning and indiscreet spraying; for, while fertilization and pruning and spraying all have their proper place in the art of the horticulturist, their improper or ill advised or indiscreet use, may, and often does result in confusion and disaster.

There are some of us whose very life is so wrapped up in trees and plants and vines and flowers and shrubs, that we should continue cultivating them, for our own pleasure, even if we knew there were no other profit to be derived from them; but, to the majority of us, there is also an intensely practical bread-and-butter side to our calling, that makes it incumbent upon us to look to horticulture from a commercial standpoint.

The questions of what to plant; where to plant; how thick to plant; how to cultivate; how to fertilize; to prune or not to prune, and how and when; to spray or not to spray, and what for, and what with, and how often; these and many other questions will be open for your consideration and discussion during this meeting; and, if you can point to any known wrong roads, that any of us have been following or are apt to follow, you will be carrying out the purposes of mutual help and instruction and "advancement of horticulture" and for which this Society was organized.

The sign-boards which you may help to erect, pointing to a nearer cut, or less hilly path, may well be supplemented by placing an obstruction across any old time-worn, rutty, "wrong roads," at the points where they should be abandoned for the better way.

SECRETARY'S ANNUAL REPORT.

[SEE MINUTES PAGES 1 TO 5, ITEM 11.]

Mr. President and Fellow Members: Some weeks since I found myself needing mental relaxation, and counted myself fortunate in being able to obtain rest by availing myself of President Taber's very kind offer to relieve me of the work of the Secretaryship until the approaching annual meeting of the Society. I placed my resignation in his hands on the 8th of March last.

In referring briefly to the work of the Secretary's office, from the time of the Secretary's annual report at the last (9th) annual meeting, to the date of resignation above mentioned, I will pass the routine of the office without further comment than to say that it has been carried on in the usual way, as set forth at length in the Secretary's last report. The customary effort has been made along the line of "Publicity and Promotion," with good effect, as is shown by the "Membership" and "Financial" exhibits.

As this report covers but a portion of the year, I pass "Necrology" and "the Press" without reference.

The financial transactions of the Secretary's office for the period specified have been as follows:

"On hand for Treasurer's account," as per Secretary's last annual report	$ 407 00
Dues for 1895, collected	26 00
Dues for 1896, collected	107 00
Dues for 1897, collected	55 00
Life memberships	30 00
Extra copies annuals	1 50
	$ 626 50

Dec. 31, 1896. Remitted Treasurer	$ 604 50
March 8, 1897. Turned over to G. L. Taber, President	22 00
	$ 626 50

(It should be noted that a considerable portion of the sum mentioned as "on hand for Treasurer's account," was in the form of paid bills, covering expenses of 10th annual meeting, and did not represent the Society's funds lying idle in the Secretary's hands.)

As shown in Secretary's last Annual Report, the Society's membership increased from 248 in 1893 to 477 in 1895, a gain, which it has since held. During the same time the Society's receipts have steadily increased, for the last year (1896) reaching $682.50, the greatest in the history of the Society.

I have been your Secretary now for nearly three years, and feel that it is a matter for felicitation that during this period the Society has made steady growth.

While I regret that it has seemed essential that I ask to be relieved of the duties of the Secretaryship before the expiration of the term for which the office was entrusted to me, as this has seemed essential, it is a source of satisfaction that it could be done at a time when the Society was enjoying substantial prosperity.

May its growth continue and its prosperity increase. A. H. Manville.

REPORT OF ACTING SECRETARY G. L. TABER.

[SEE MINUTES PAGES 1 TO 5, ITEM 12.]

Since taking charge of the Secretaryship on March 8th, the proceedings of the ninth (1896) Annual Meeting of the Society have been received and forwarded to members, and additional printed matter issued and disbursed as follows:

March 8th.—Slip calling attention to the Secretary's illness and that the work pertaining to the Secretaryship would be carried on by the President.

March 25th.—Circular letter to Editors of the State Press, informing them of complimentary copies of the 1896 Report having been forwarded them, and requesting notice; also enclosing form for notice to be used if desired.

March 27th.—Circular letter to all the members notifying them of the 1896 Report having been forwarded, and calling attention to the approaching annual meeting, and also to the date at which their membership expired, and suggesting the advisability of immediate renewal.

March 27th.—Circular slip entitled: "Helping increase the Membership," in which also the advantages of a Life Membership were pointed out.

April 20th.—Credentials to members, and circular letter in relation to same, accompanied by circulars giving detailed information in relation to the Orlando meeting.

April 20th.—Marked circular to old members, who had not renewed for 1897, calling their attention to the importance of immediate renewal.

THE PRESS.

The thanks of the Society are due to the State Press, which has so generally and so generously assisted us. Particular recognition is due to The Florida Farmer & Fruit Grower and the Florida Agriculturist for repeated and extended notices.

A full list of the papers that have filed marked notices with the Secretary, accompanies this report, marked "Exhibit 1."

MEMBERSHIP.

Following is an exhibit of the membership—taken at 9 A. M., May 5th., 1897:

Honorary members	2
Life members	25
Annual members (fully paid for 1897)	359
Actual membership	377

This exceeds by five the largest membership that the Society has ever had at a corresponding time of the year. The nearest approach to it being at the time of our meeting one year ago, when the membership was 372.

FINANCIAL.

Received from Secretary Manville on March 8th	$ 22 00
Dues for 1895	3 00
Dues for 1896	14 00
Carried forward	$ 39 00

Carried forward	$ 39 00
Dues for 1897	289 00
Dues for 1898	7 00
Life memberships	40 00
Extra copies 1896 Report	3 00
Donation from Amos Wakelin	1 00
Donation ay 4, 1897 from A. H. Manville	62 50
Turned over to treasurer May 5 1897	$442 50

Respectfully submitted,

G. L. Taber,
Acting Secretary.

THE PRESS.---EXHIBIT I.

STATE PAPERS.

Florida Agriculturist, DeLand Fla.

Florida Farmer & Fruit Grower, Jacksonville, Fla.

Daily Reporter, Orlando, Fla.

Baker County Press, Macclenny, Fla.

Times-Union, Jacksonville, Fla.

Florida Facts, St. Francis, Fla.

Citizen, Jacksonville, Fla.

Columbia County Citizen, Lake City, Fla.

Philosopher, Crescent City, Fla.

St. Augustine News, St. Augustine, Fla.

Courier, Plant City, Fla.

Chronicle, Sanford, Fla.

Breeze, DeFuniak Springs, Fla.

News, Pensacola, Fla.

Tribune, Tampa, Fla.

Sun, Gainesville, Fla.

Southern Ruralist, Interlachen, Fla.

Idea, Avon Park, Fla.

PAPERS OUTSIDE FLORIDA.

Farm, Field & Fireside, Chicago, Ill.

Ohio Farmer, Cleveland, O.

Southern Agriculturist, Montgomery, Ala.

Texas Farm & Ranch, Dallas, Texas.

Picayune, New Orleans, La.

Times-Democrat, New Orleans, La.

Horticultural Gleaner, Austin, Texas.

(The following discussion relative to the acceptance of the proffered donation from Mr. Manville of the salary due him took place immediately after the report of Acting Secretary Taber was read.)

Mr. Bacon: It seems to me that this Society ought to refuse to accept Mr. Manville's donation. I move that this Society do not accept Mr. Manville's donation.

Mr. Manville: I am going to ask the gentleman to withdraw his motion. I think the Society should accept donations of this character from any source; we need donations of this kind to help out our finances. One of the conditions of my accepting the office was that I was not to receive anything. I thought it due to the office that the stipend should be drawn and turned back into the treasury.

Mr. Wright: Those that were present at Jacksonville last May will remember that I made the motion, that the Secretary be allowed the sum of $200. Mr. Manville at that time very graciously and kindly declined to accept the money, which I was ready then to acknowledge that they justly owed him. I believe I can fully appreciate the position taken by Mr. Manville today, but I believe this association is willing to admit the laborer is worthy of his hire, and while this amount will not pay Mr. Manville for the services he has rendered this Society, yet I believe it would be unjust to receive this donation from Mr. Manville under the circumstances. I think he is justly entitled to it.

Mr. Hart: It does not seem to me there is any question whether he is justly entitled to it or not. I consider the stipend so small in proportion to the work he has to do, that it is almost ridiculous, but it is as large as this society can afford to pay. No

one, who is not conversant with the labor of the office can form any idea of the amount of time it takes, and oftentimes when other work is most pressing; if it were all put together, day by day and hour by hour it would require months of steady work to do what is necessary to carry out all the duties devolving upon the Secretary of this Society. The membership today shows the effects of the labor he has done in using every means within reach of increasing the membership of the Society and strengthening it. I don't know that I feel like urging the matter very much one way or the other. I think Mr. Manville ought to have the money, but I don't want to refuse him the privilege to give it back, but it looks to me that without the giving of that money back, he has still given the association far more than any other member during the year.

Mr. Davies: It does seem hard that a gentleman can not be permitted to do a handsome act of kindness. Yet the remarks of these gentlemen are correct. We must not allow Mr. Manville to wrong himself. The record would be ambiguous. We of course understand it. Others would not. The record would read, "We decline to receive the donation." I respectfully suggest that the motion be in this form: "With a profound sense of Mr. Manville's kindness, under the circumstances we think it best to decline the donation."

The amendment being accepted, the motion was carried unanimously.

TREASURER'S REPORT.

[SEE MINUTES PAGES 1 TO 5, ITEM 86.]

Report of Treasurer J. B. Anderson from date of last report up to Jan. 1, 1897:

1896.			
Jan. 1.	To balance in hands of treasurer as per last report..		$ 222 83
Feb. 12.	Received from Sec. Manville.		604 50
Dec. 31.	Received from Sec. Manville.		256 00
			$1,083 33

Contra.

Feb. 12.	By paid Secretary's draft No. 6.		
	Expressage	$ 30	
	Expressage	25	
	Telegrams, stationery and n'spapers	1.97	
	H. & W. B. Drew Co. copying book ..	90	
	Expressage	25	
	Hotel and Ry. fare of Sec. trip to Jax	5.00	
	Postage and reg.. fee on MS. to E. O. Painter & Co. .	26	
	Stamps and addressing circulars	3.60	
	Postage stamps .. .	2.00	
	H. & W. B. Drew Co., for printing .	20.50	
	H. & W. B. Drew Co., for Envelopes and printing	3.30	
	Expressage	.50	
	Freight F. C. & P. R. R. Co.	2.76	
	S. F. Hall for printing	4.00	
	H. H. Slayton, P. M., postage stamps ..	34.00	
	F. C. & P. R. R. Co., freight	2.97	

H. H. Slayton, P. M., postage stamps .. 10.00
E. O. Painter & Co., 100.00
Expressage 3.50
H. H. Slayton, P. M., postage stamps .. 10.00
Telegrams to Executive Committee. 3.66 209.72

Mar. 21. By Paid Secretary's draft No. 7. E. O. Painter & Co 101 30
Paid exchange on above.. 25

Dec. 31. Paid Secretary's draft No.8
Expressage.. .... .35
E. O. Painter & Co.. ... 4.50
Newspaper advertising .. 31.00
Expressage .... .45
Expressage .... .20
H. H. Slayton, P. M., 1,600 1-cent stamps 16.00
H. H. Slayton, P. M., 1,000 1-cent stamps ... 10.00
Expressage .... .20
S. F. Hall, printing 55.55
Stenographer 80.00
W. S. Hart, rebate 1.00
Expressage.. 45
Expressage .. .. .20—199.90

Dec. 31. Paid Secretary's draft No. 9.
Sundries at annual meeting 1.05
Miss Grimme, copying .. 2.00
Hotel Placide, room for headquarters 7.50
Times-Union, extra copies report 1.20
J. A. Daniel, P. M., postage stamps 20.00
A. H. Manville, secretary's stipend 75.00
Freight on Report ..... .25
Miss Taber, clerical work 7.00
G. St. M. & N. Co. files, stenographer and typewriter 35.87
A. Frink, typewriting, etc 2.92
S. F. Hall, printing 5.60
J. A. Daniels, postage stamps 40.00
A. Frink, typewriting, etc .... .70—199.09

Dec. 31. Paid Secretary's draft No. 10.
E. O. Painter & Co on account of annual report .. 200.00

1897
Jan. 1. Paid W. S. Hart, treasurer to balance account 173.07

1,083.33

Report of W. S. Hart, treasurer, from Jan. 1st, 1897, to May 5th, made at annual meeting.

Jan 1st. To balance received of former treasurer 173.07
May 5. Paid in by Acting Secretary G. L. Taber 441.50

614.57

Per Contra.

May 5. By paid secretary's draft No. 11
S. F. Hall, printing envelopes 3.50
Freight on above ..... .25
S. F. Hall, printing letterheads, etc 10.25
S. F. Hall, printing 1,000 slips 1.50
Postage, J. A. Daniel, P. M. 34.00
Freight and express bills dated March 19, .., 25, 26, 1897 .... 7.73
Freight bill April 2, '97.. 3.32
J. A. Daniels, P. M. postage 14.00
Freight and express bills March 14, 18, 1897..... .65
S. F. Hall, printing bills April 14, 17, 1897 ..... 22.25
Express on above ..... .30
S. F. Hall, printing ..... 10.50—108.25

May 5. Paid secretary's draft No. 12
Secretary's stipend for time served 62.50
May 5. Paid secretary's draft No. 13
E. O. Painter & Co, to balance account to date 65.00
May 5. Balance in treasury 378.82

614.57

EXECUTIVE COMMITTEE'S ANNUAL REPORT.

[SEE MINUTES PAGES 1 TO 5, ITEM 14.]

Mr. President and Members of the Florida State Horticultural Society, Ladies and Gentlemen: An anomalous condition confronts the officers and Executive committee of this Society in making their annual reports. For convenience in preparing for, and to avoid confusion in publishing the proceedings of the annual meetings, the terms of officers and membership in this Society were made to begin and end with the calendar year, but it seems necessary for the annual reports to still cover the periods of from meeting to meeting.

To conduct the business of the Society in a perfectly formal and proper manner four meetings a year of the Executive Committee would be necessary: First, a meeting early in the year, at least two months before the annual meeting, when the President can announce the standing committees; the Secretary and Treasurer report the state of their offices as received from their predecessors, and the Executive Committee authorize the necessary preliminary work for the next annual meeting. At the annual meeting, one or more meetings are necessary for auditing bills, and discussing measures that have been referred to the Committee, or which should be brought to the attention of the Society. Shortly after the annual meeting, a meeting of the Exective Committee would be necessary to ascertain the amount of funds on hand, and consider proposals for and authorize publication of the proceedings of the annual meeting. Finally, after the proceedings have been published and sent out, it would be necessary to meet and audit and pay the bills and close up the miscellaneous business of the year.

A plan like this, however, for performing the business of the Society is difficult to realize in practice. This State in the matter of travel, indulges in magnificent distances, and the officials of the Society perform their services without compensation, for on account of the scanty funds that have been at the Society's disposal for the preparation and publication of the proceedings, the Secretary has even donated back to the Society for the past three years the small stipend voted for that office, and convenience and time, as well as expense must be considered by the officers in holding Executive Committee meetings.

Your Executive Committee, and the Society's officers being practically the same as for the previous year, have, therefore sought to perform the Society's business with the least possible inconvenience to the individuals concerned in it, and, therefore, at the last annual meeting authorized the Secretary to arrange for publishing the proceedings in the same gen-

eral style and manner as in the previous year.

At the last annual meeting the catalogue as submitted by the Catalogue Committee was referred to the Executive Committee for revision and adoption, and August 13th, a majority of the active members of the committee met informally, and revised and adopted the catalogue, using for the Citrus section the Nomenclature Committees plan of classification of oranges, as recommended to this Society at the 1894 annual meeting. As there were differences of opinion as to the scope of the resolution as to adoption, a formal meeting was held at Sanford, December 3rd, 1896, at which the catalogue was directed to be published as submitted by the Catalogue Committee, and 100 copies of the revised Citrus section were ordered printed for the use of the Society in the final adoption at this meeting.

As the time for the preparation for this annual meeting was approaching, and a majority of the Committee held over, the Secretary was authorized to make the usual arrangements.

At the Executive Committee meeting held May 4th, 1897, the bill of E. O. Painter & Co., for printing the last annual report, and the bills and contracts of acting Secretary Taber in preparing for this meeting were accepted and approved. The President was also authorized to appoint a Committee on Necrology.

The Florida State Horticultural Society is neither a mercenary nor political organization, and it represents the combined brains, energy and investments of the largest industries in the State; compared with the population of the State its membership is large, but only by the most careful management has it been able to conduct its meetings and publish its proceedings. We have asked for, but have never yet received such assistance from our legislature as is granted to kindred organizations in sister States. If we could use annually for printing our proceedings five hundred dollars even of the thousands that are spent in electing a senator, they would add more to the material prosperity of the State than a whole term of that Worthy's services in Washington.

Respectfully submitted,

E. S. Hubbard,
Acting Chairman.

Remarks relative to change in the voting membership of the Executive Committee were made during the evening session of May 5th and morning session of May 6th.

Mr. Wright: I notice at the bottom of the program that the President, Secretary and Treasurer are ex-officio members of the Executive Committee. I understand that is simply advisory, that they are not entitled to any vote. I am in favor of making the President and Secretary members of the Executive Committee, not the Treasurer, and not ex-officio. With the Treasurer out I see no reason why they should not have a vote. Up to about two years ago they had a vote and were part and parcel of the Executive Committee. Two years ago the report of the Executive Committee changed that. I would respectfully ask this association when properly put before the house not to vote it down until they have well considered the matter. I would move you that the President and Secretary be made full members of the Executive Committee, and that the By-Laws or Constitution be changed so as to permit it. I move that it be made a

special order for tomorrow morning's meeting. Motion carried.

A Member: The By-Laws and Constitution can not be changed except by unanimous vote; if any objection it will have to lay over one year.

During morning session of May 6th the above motion was called up.

Mr. Wright: Until two years ago, I think the President and Secretary were full members of the Executive Committee. For some reason or other it was changed. I feel like this, if the President and Secretary are worthy of having any place in the Executive Committee they are worthy of having full place and vote. I have left the Treasurer out, because under the rule, as I understand it, this Executive Committee audits the accounts. That is the reason I offered that resolution. Knowing as much, or more of the workings of the Society and the importance of the Society; knowing we have always had those, who have the best interests of the Society at heart as officers, they should have a vote of the Executive Committee. I did it without consulting any one else; I have done it on my own motion, and from my point of view I think it proper. It has been the case in all societies with which I have been connected.

Mr. Bacon: I hope the meeting will make this business very short. The Secretary and President have power to sign checks on the Treasury, and it is not proper to allow them to audit their own checks.

Mr. Hubbard: This motion is an amendment to the Constitution and By-Laws; I object.

Mr. Price: The notice will be held over until next year.

REPORT OF THE SPECIAL COMMITTEE ON LOCAL ARRANGEMENTS.

GEO. H. WRIGHT.

[SEE MINUTES PAGES 1 TO 5, ITEM 9.]

Your Local Committee appointed by the Executive Commitee of this organization, takes pleasure in making a verbal report. They have had the cordial support of the business men of Orlando in the matter of finance, organization and preparation for this meeting. They not only have had the cordial support of the business men of Orlando, but we have also had the decorative support of our ladies, which is here shown tonight.

We take pleasure in stating, that arrangements have been made by the Board of Trade for an excursion to Lake Charm at 2 o'clock Thursday afternoon. All members of this Society are cordiall invited to participate in this excursion without charge. Any citizen or others, that desire to take part in that excursion can do so on the payment of 25 cents for the round trip. It is a pleasant trip to Lake Charm, one of the noted places for orange growing, and we will take pleasure in accommodating all that will go with us. That excursion will stop at Winter Park and lay over at Rollins College about twenty minutes. We cordially invite all to go with us.

REPORT OF THE STANDING COMMITTEE ON CITRUS FRUITS.

Paper prepared and read by Mr. A. H. Brown, Manatee, Fla.

[SEE MINUTES PAGES 1 TO 4, ITEM 21.]

Mr. President, Ladies and Gentlemen of the Florida State Horticultural Society: Our late President appointed me as one of the Committee on Citrus Fruits, and while my experience is limited as compared with many of our older members, I may be able in a short paper to introduce this subject, and the discussion which is sure to follow will be the greater source of information and instruction.

My experience dates back to the winter of '84 and '85, just one year prior to the memorable freeze of '86. At that time I located at Belleview, Marion Co., putting out a few hundred orange trees, which, of course, were killed to the ground a year later. I then put out another grove, and it did beautifully for the four years following. Trees had some fruit on and in full bloom when the severe cold snap of March 2nd., 1890, came, followed two weeks later by an equally severe but more injurious cold wave. Thermometer in our section on both occasions registered 20 degrees, and my trees then six inches in diameter went nearly to the ground, and my spirits slumped into my boots.

The latter arose, however, in a few weeks, for I observed that groves that were located in the hammocks with forest protection, pulled through in good shape. I then purchased ten acres of as fine land, magnificently timbered, as could be found and soon had another grove started, a portion of which was in grape fruit. But, alas, I was doomed to disappointment once more, for the freeze of two years ago ruined everything, and I decided that perhaps I was not to blame for having made the effort to secure a grove in that section, but that I should be, did I make another attempt. I acknowledged myself whipped and retired as gracefully as possible under such circumstances, and decided I would make a search for the frost line. I may not have been absolutely successful in that attempt, but I made up my mind that wherever I found trees that were bearing a crop the season following the freeze it must be a fairly safe location. The foregoing accounts for the change in my postoffice address from Belleview to Manatee. Many of the members are acquainted, more or less, with that section of the State; it has its advantages and disadvantages. I became interested as manager of the Foster groves of 50 acres, mostly in bearing condition. A greater portion of my experience heretofore had been with raising trees up to the bearing size and age, for at that point the greater and lesser freezs have interrupted operations. It is a saying, that "hope deferred

maketh the heart sick;" my hopes have certainly been deferred several times, but we think we see light ahead at last.

With my change in location I came in contact witn some things in connection with orange growing in the way of insect enemies, that I had no experience with before. One in particular has caused more damage in this immediate section than all others. I refer to the White Fly. I presume this matter will be more exhaustively treated by Prof. Webber, who has made very thorough investigation, and I don't wish to trespass on his ground. I will simply give my own personal experience with the pest. At the time of the freeze many of the groves on the south side of the Manatee river had become so weakened by the work of the White Fly, that they were unproductive, and with the low price of fruit it was not much encouragement to expend money upon them: In fact many refrained from fertilizing and working their trees, because the new growth seemed to be just what the fly thrived best upon. Its first appearance on the Manatee river was in the Foster groves about eight years ago. At the time of the freeze the trees lost nearly all their foliage, and Mr. Foster thinking it the time to get rid, if possible, of the fly, spent several hundred dollars defoliating every tree entire. The result was only a temporary check. The new foliage was bright and clean, and there were no signs of the fly to a casual observer, but one who was familiar with its insidious workings, could discover that there were just enough left to seed all the groves again, and the winter following we sprayed most thoroughly and kept them in check, but as the foliage thickened it became more difficult and almost impossible to reach the under side of all the leaves. We sprayed the last winter again, but in spite of us, there is a great increase of the flies.

Now there were other groves owned by different parties nearer the river, which lost but few leaves; these parties would not spray; they discovered late last summer, that their fruit, which heretofore had been covered with the "sooty mould" was now bright, and searching further they found an enemy to the fly in the form of a fungus growth, which attaches itself to the scale on the under side of the leaf and spreads over the whole leaf, and in a remarkably short space of time over all the foliage.

This, of course, is a joyful discovery to the growers in our vicinity. I have very recently examined these groves, and I find the new spring growth perfectly clean, and it is a difficult matter to find any traces of the fly upon it. This certainly seems to be the remedy for which we are looking. Spraying is a very expensive operation, and at its best is but partially effective. There is no question but that the rosin wash is effective in so far as one is able to reach the leaves, but to touch them all is about impossible.

Small nursery trees infested with this new fungus are now being planted in the groves where the White Fly has become abundant, in order to spread the fungus as rapidly as possible.

I find comparatively little foot rot among our seedling groves, but another disease, the "Blight" is prevalent and up to this time has refused to yield to any treatment. Quite a per cent of trees in this section are suffering from this malady.

I wish to touch upon the subject of the disposal of our citrus fruits after having raised them. There are orange growing

sections which we need have no fear of competition, but during the past winter, however, consumers through the north have found oranges that nearly, if not quite, took the place of the Floridas. Reports from all sections of the State give one the impression that it will not be many years before the groves will be in full bearing again. In this section there will be a largely increased acreage, but it seems to be fairly well divided between orange, lemon and grape fruit. The Atwood Company are now putting out 200 acres in grape fruit exclusively, setting them 30x15, which will make a grove of 20,000 trees. Their rows are three-fourths of a mile in length. Several thousand trees are already set out, and the balance will be set this summer and fall. The Manatee Lemon Co., have also put out sixty acres in grape fruit. Both of these companies are backed by unlimited capital, and these groves will be pushed for all they are worth. Many new and smaller groves of oranges and lemons are being set.

From all that I can learn from nurserymen and others there will be a much larger acreage in the earlier varieties, especially in middle Florida, and those localities which are fairly exempt should put in the later ones. In this way the season will be extended. The greatest danger, however, will come from foreign importations. It would seem to me that the Florida grower should take more interest in the tariff legislation affecting Citrus fruits, which is now being discussed in Congress. California is on hand, looking after her interests, and perhaps as a State she can do so more consistently than we in Florida. However, this may be a subject for discussion and perhaps some action.

Matters pertaining to fertilization I hope will be thoroughly discussed. Is it possibly by any system of fertilizing to insure a full crop of fruit on seedling trees every year all other conditions being favorable? Having introduced this subject, I leave it to the Society to discuss at length.

BEST METHODS IN FUTURE FREEZES.

Resolution Introduced by C. A. Bacon for the Purpose of Putting on Record the Opinion of the Society as to Best Method of Treatment of Citrus Trees in Future Freezes, Together With Discussion Thereon.

[SEE MINUTES PAGES 1 TO 5, ITEMS 22, 23 AND 96.]

(The resolution as introduced stated 20 degrees as the minimum temperature; the resolution as printed herewith being the resolution as amended by the Society before passage. This discussion took place during the morning sessions of the second and fourth days but is combined in this report as bearing on the same subject.)

Mr. Bacon: I am heartily glad our friend Brown has found a spot "below the frost line," but I hope he will not forget his friends, who still live above the frost

line, whose hearts are gradually rising "from their boots." This Society is making a record this season for the benefit of the people, here today, and also for the generations that will come after us. We hear of the terrible bite of the rattlesnake, or of the more deadly animal, the mosquito, and we immediately run for a remedy, and where do we look? We look in the records of the past for the remedies; we hunt for the experience of others. And so I believe it is the duty of this Society to leave a record, or to leave something on record, whereby the poor fellows that follow us, the poor orange raiser that comes to Florida years hence, with the determination to raise an orange grove for a profit, can have the advantage of our experience. Hence, Mr. President, I wish to introduce a resolution at this time, not asking that it be passed without argument, without revision, without consideration; not asking that it be passed at this time, at this stage of the meeting; but later on I would ask for its consideration and your arguments on it.

Whereas, after the lapse of two years following a calamity to the State of Florida, greater than that ever happening to any State in the Union, we believe it is our duty as the Florida State Horticultural Society to place on record for the benefit of future generations, the conclusions of the majority of the members of this Society, as to the best course to pursue in case another event of the same nature should occur: Therefore, Be it Resolved by the majority of the members of this Society, this day assembled; that in case the thermometer should ever hereafter fall to 16 degrees after the first of February, or at any time after the first of January when the citrus trees have put on the new spring growth, and remain at that temperature six hours, or more, it is our opinion, after two years experience following such an event, that the best policy, (except under extremely favorable circumstances,) to pursue is to cut all citrus trees close to the ground.

D. O. Davies: One year ago I had the pleasure of calling the attention of this Society to the protection of our groves against cold. I wish to add a few words now. I will not detain you long. Most I have to say was said a year ago. I have no modification to make of the statements then made, which are on record in the minutes of the last annual meeting.

I have, however, an additional statement to make, and think it may be of service. Mr. Brown explained his leaving this region because of two failures on account of the cold; that the freeze had destroyed the trees and thus discouraged him—that was the idea Mr. Brown? (Mr. Brown: "It was.") And this resolution seems to imply the same. Now the Society may think the statement I am going to make is a very rash one; it may be so but appears to be true, that mere freezing never killed a citrus tree in Florida. That shocks you. The freezing itself never killed a citrus tree in Florida. Many of you have seen the story of an artist in red and white, of a man going up a ladder carrying bricks and mortar, and who fell three stories. A sympathetic person came up and said, "Pat, did the fall hurt you much?" "No soher, not a bit, it was the sudden stop." (Laughter.) So, Mr. President, it is not the freezing that kills the tree, it is the sudden thawing under sunshine. I ask your attention to the analogies of the case. Living human beings are frozen frequently up North. They have frozen noses, frozen ears. Take them

right to the fire and thaw them out and those members will mortify and drop off, but take that frozen ear or nose and thaw it out gradually and that member will be as valuable as ever. Take your observation. Mine has been somewhat extensive; and I have given this matter serious thought for a number of years. You have seen trees injured by the cold, not killed. What side of the tree was injured? Without exception so far as my observation has gone, it was the southern side of the tree. I had three or four trees thus injured in one of my groves. Just one-half on the south side was dead. The northern side the bark was fresh and made an effort to cover up the dead part on the southern side.

Up in Kentucky, they are aware of this fact. When the plants of my lady friends are frozen by unexpected cold, they take them up and put them in cold water and let them stay there long enough, and they come out as vigorous as ever absolutely unhurt so far as we can see.

The freeze of '86 was cold enough to have destroyed all of the orange industry in Florida. I was in Kentucky. A friend managing my affairs wrote me the morning after the freeze that Florida was done for. Do you remember we had four or five days continuous cloudy and rainy weather, and there was scarcely a tree destroyed. They thawed under shade. They thawed untouched by the sunshine, and while most of the trees lost their foliage, even the small twigs were not injured. The only explanation is, they thawed out gradually under the shade. It was a gradual thaw; there was no sudden sunshine to hurt them.

In the late freeze that hurt us so, I and my neighbor preserved our groves by firing for 72 hours. There were a number of trees, between 50 and 100 not reached by the heat that were badly frozen. These trees were eight, ten and eleven inches in diameter. I directed my man to take his knife and slit down the bark on each side of the split from the cold, because my observation had led me to believe, that the damage was caused by the souring of the sap in the tree under sunshine; and the spreading of it around the tree did the damage. In addition I had him wash the split from the cold with a mixture of lime and caustic soda. And in addition, happening to have a good deal of lumber, I told him to take two boards and nail them together, V shape, and put on the south side of the trees to protect them from the sunshine. Under the protection of these boards not one of those trees was injured on the south side.

I have no theories on the subject, I am simply reporting facts. They stand there today. I don't think in my grove there is an inch of deadened wood on the south side of those 50 or 100 trees so frozen as to have bursted the bark, and possibly some of the fibre of the immediately underlying wood. It does seem to me this is a demonstration. Take '86, why did we escape? Because we had three days rainy and cloudy. There were but three hours of this in '95, but immediately followed by bright sunshine.

I had some time ago—last year I think it was—to catch an early train, and passed several fields of tomatoes early that morning; a heavy frost having fallen, I noticed where the plants were in the shade protected from the sun light, they stood up fresh and firm, and where the sun struck them the leaves had wilted and they were more or less damaged.

Now, Mr. President, my point is this, if we can protect our frozen trees from sunshine and let the thawing out come gradually in the shade, we save the trees, it may be the little nursling or it may be the large tree. The difficulties of firing are very great in some cases. I still hold that it is ample protection where it is sufficiently done. Here is a case where you can take your little tree—and I have thought it out and corresponded with a New England paper factory and learned with their present facilities cost of production would probably be too great. But I think with this method you can in a small way protect the small trees. My thought was, to have paper, water-proof on one side, inside lined with cotton, (or any other soft non-conducting material would do,) make a simple, very long cone of that sort (indicating) put it over the small plants, and with your foot draw up sand until you have it in place, and your plant is perfectly safe, if my experience justifies my conclusions. There is a carpet lining made of two thicknesses of paper and including a layer of cotton. Now take your water-proof paper attach this carpet lining to it and you will have an impervious protection of the sort I speak of. If you want to protect the large trees you have only to loosely wrap it round them, up to the limbs. If such a cold should come again, add a little heat to go along over the top of the trees, and you will have a reliable protection. You need space for air between the tree and the covering.

I repeat as a result of my observation, freezing does not kill the orange tree. Subsequent conditions are the death of it; it is the sudden thawing under sunshine. If we can protect our trees, small or large, from the sunshine after the freeze we save the trees.

Mr. Bacon: I would like to ask the gentleman if there was continuous sunshine after the freeze two years ago?

Mr. Davies: Yes, my recollection is that the sun came out beautifully; it was so with us.

Mr. Bacon: I think in our locality there was continuous cloudy weather after the freeze, and it don't seem to uphold your argument in that case.

Mr. Davies: There is nothing so uncertain as memory of weather not fixed at the time of occurrence. I give it as my own observation of facts, not open to question. There are trees that were bursted with the cold and they are growing healthily today.

Mr. Bacon: I would like to ask Mr. Knox, who lives in my vicinity if it was not cloudy several days after the freeze two years ago?

Mr. Knox: I think it was, after the freeze in February.

Mr. Bacon: I think it was a week.

A member: I live in the section from which Mr. Bacon comes, and I remember distinctly; it was sunshiny weather.

Mr. Davies: I had this thing in mind, and I informed myself at the time. It was sunshine that killed the trees.

Mr. Bacon: I don't think that if it had been as black as Hades two years ago it would have saved the trees.

Mr. Margary: Last January there was a little freeze one night, pretty sharp, went down to 26 degrees for two hours. That morning I received a telegram from the Weather Bureau to telegraph the state of the weather and the state of the trees. I telegraphed back that we should probably

lose our trees but afterwards it came up cloudy and saved us.

Mr. Waite: I just want to say a word relative to Dr. Davies' suggestion that we use paper. I would say that in Belleview in 1890 there were several gentlemen who used paper in cone shape over the small trees. In nearly every case those trees were killed to the ground. Perhaps the wool or cotton inside might prevent damage, but the paper alone would not answer.

Mr. Davies: I did not say, "wrap the trees tightly," I believe that would be a disadvantage. I spoke of having a lining protection with a stratum of air between that protection and the tree, large or small. That would permit the processes of nature to go on; that would protect from the cold and give it air and shelter. I wrapped with moss and discarded that, because it was too close to the bark. Newspapers in the first place are not water-proof, and in the next place they press against the tree. I do not know whether the actinic rays have anything to do with it. Perhaps the heat does it; the heat rays go right through into the tree and work damage. I don't think the X rays have anything to do with it. My understanding is, it is the heat rays that produce the souring and fermentation. We should observe two points, simply these: First, keep the cold off as much as possible. I think this does it. Use carpet lining, or if practicable, canton flannel inside. These two will keep any ordinary cold for any ordinary length of time from freezing the trees. Secondly, if it should accomplish the work of freezing, then you have an arrangement for the processes of nature to go on in shade and it will thaw out gradually. As a confirmation of this, a gentleman gave an account of a case right up here. The trees were all interlaced, limbs interlaced where the sprouts were growing. The top parts were all killed in that great freeze, but the growth was thick and shaded the lower part from the bright sunshine, and so the lower part escaped. Sunshine killed. Shade saved.

Mr. Gaines: I recognize the statement of facts, but I can not agree with the gentleman as to the conclusions he draws from those facts. It won't do to say the freezing don't hurt the trees, because if there was no freeze the trees would not be hurt. You may mitigate the injury to the trees by after treatment, but the damage is done by the freezing. Where the trees were interlaced it was not the shade that protected those trees, afterwards; it was the fact they were protected from the freezing.

I say in my observation—I may not have as great as some of these gentlemen either in years or experience—it is not the weather following the freeze; it is not the degree of cold particularly, because a certain degree of cold will kill orange trees if continued long enough. The point is this, and that is the point we have to guard against, it is the condition your tree is in when the freeze comes. A tree, if an orange tree or anything else, full of sap, frozen, will be injured; if the tree is dormant, the freeze will not hurt it so much. I have in my own yard an illustration, a vine that is as hardy as the oak in the North; in Florida the freeze killed it as quick as it did the geranium, because during the season the freeze occurred when it was full of sap, in the North it is dormant when the freeze comes.

I say you may protect orange trees to a certain extent from freezing and you may

mitigate the damage after the freeze. We know after the cells are frozen up they can not take up the returning sap so quick. It is much easier to protect those trees in the beginning, stop those trees from being full of sap at the time of the freeze.

In January of this year the trees were not hurt much. We know just before that freeze that it had been extremely dry, the trees were dormant, and they stood that freeze with little or no damage.

Mr. B. M. Hampton: I would ask if any gentleman ever tried to spray his trees on the eve of a great freeze by coating them with ice. I had a little bit of experience in that line once, tried it on lemon trees. I coated them thoroughly with ice, all the branches. Those trees I sprayed with water I made a complete coating of ice on them, and I failed to find a single particle of bark on those trees cracked; those I did not spray were cracked very seriously.

(In the morning session of May 7th during the general discussion on Citrus fruits Mr. Bacon's resolution was called up.)

Mr. Bacon: Before we drift off the subject, the subject I brought up—the resolution left on the table, I would like to get the opinion and expression of the members of this Society on this subject. I see that several gentlemen have touched on it, and they seem to be of my opinion. We should not be selfish; we should consider those who come after us. We are drawing near the vale, after passing which we are never to return. Some of us are getting old; I am not in that crowd yet, but we are bound to come there. This Society is a State Horticultural Society, and we are leaving a record. We know what a severe trial we passed through; we know how vital it was, it was death to many, and almost death to all of us financially. No other people in the United States could have stood up as we stood up under this calamity. I had a friend come to my place this winter,, and when we told them of the freeze; of our work of 20 years cut to the ground, not like one year's crop in Kansas cut by the grasshoppers, where they can plow and plant next year and raise their crops, and what do they do under such calamities—we hear the cry go out to the whole country to help the poor grasshopper eaten people. See what has been done here—not one year's crop cut off, but 20 years labor and the crop of five years. People of the North little realize what Florida has gone through. They heard of the freeze, but supposed we had got our oranges to the market. They came here and looked for oranges on the trees; they looked at our vines and the little family affairs and decorations, and say they are pretty, "but we want to see oranges;" that is what they want to see. I say to them, "My dear friends, did you hear of our calamity two years ago; do you realize what happened here?" "No, we heard of the freeze, but we did not realize it." "How do you stand it?" they say in astonishment. Simply the laws of nature were here before we came; the Juggernaut of the laws of nature ran over us, we peeped out one eye and saw the sands of Florida and we raised up and said, "We know what Florida will do." "You deserve great credit," they say, "it is wonderful; don't see how you survived." I said to him, not a subscription paper was sent out from Florida during our calamity to help the poor orange raiser, but in case of a dam-burst at Johnstown, or damage by the grasshoppers out West,

whole columns of the New York daily papers are devoted to helping the poor sufferers in the West; they have lost one year's crop, lost some buildings; lost some one's timber, but Florida lost 20 years of labor and fifty million dollars in one night.

I wish to place on record as much as possible the A. B. C. for those who come after us. That is why I introduced that resolution. I would now at this time, if you do not object ask the Secretary to read it, and allow it to go on the record for the benefit of those who come after us.

I have seen Mr. Hart's grove; he has a beautiful grove; I don't blame him to wait before cutting off his trees. Yesterday I saw grove after grove, and tree after tree, and my friends have all said, that they really think, allowing for a few exceptional cases, and a few exceptional trees in our groves, it would have been the best policy the day after the freeze to have sawed every citrus tree to the ground. I would like to call up that resolution.

A Member: He makes no allowance for our experience in other sections of the State in '86. It went down to 20 and 18 and stayed there for more than six hours.

Mr. Gaines: I am in full sympathy with the purposes of the resolution but I am not exactly prepared to adopt it in its wording. When an orange tree is frozen cut it off to the ground. The thermometer don't have much to do with it. It is not particularly the state of the thermometer that does the damage, for a tree in one condition will stand more cold than it will in some others. A tree in full growth can not stand much cold, but if dormant it will stand a good deal. The point is not so much the state of the thermometer, but the great fact that the tree is frozen. Put it in that shape and I think it will be satisfactory; when the tree is frozen cut it off, it don't depend where the thermometer is.

A Member: In my section the thermometer went below 20. I move the minimum degree of the temperature be made 16 instead of 20. (This amendment was adopted.)

Mr. Wright: I am in favor of the resolution. I think we have demonstrated the fact in the past two years that if the trees had all been cut off after the freeze they would have been better today.

Mr. W. A. Cooper: I am sure if I had known right after the freeze what I know now, and put my men to work and sawn them clean to the ground I would have been way ahead of what I am now. If I could have gotten new trees, I would have dug all up and taken a fresh start, but I was unable to do that.

Mr. Bacon: It is suggested if the clause "with exceptional cases" be inserted it will cover all objections.

LEMON CULTURE.

Paper by Walter T. Swingle, Special Agent U. S. Department of Agriculture.

[SEE MINUTES PAGES 1 TO 5, ITEM 38]

I have selected this theme for two reasons; first, because during a three months' stay in the vicinity of Naples I was able to see the methods of lemon culture pursued there, an account of which I thought might be of interest to the members of the Society; and second, because as a result of extensive field and laboratory experiments carried on two years ago, a remedy for scab, the worst disease of the lemon in Florida, was found, which in my opinion renders lemon culture as certain of success and subject to no more, if indeed to as many, risks as orange culture.

LEMONS IN ITALY.

The two great centers of lemon production in Italy are Sicily and the vicinity of Naples. Sicily exports probably the larger amount by ten times, but on the other hand, the finest lemons are produced on the southern slopes of the Sorrentine peninsula. It is indeed a beautiful sight to drive along the splendid state roads which wind in and out, now up a ravine, now along the perpendicular face of a promontory, along the southern slope of a low but much eroded and broken spur of the Appennines which shuts out the "tramontana" or north wind, as well as all view of the fascinating but dangerous Vesuvius. Approaching from the plains on the east, which are given up to cattle raising, at first one sees only here and there a few lemon trees; but soon little groves become more numerous, and from Majori (whence the most celebrated fruit is exported) to Amalfi, and miles beyond, the steep mountain sides are laid out in splendid terraces with stone retaining walls built like the old Roman aqueducts, strong enough to stand for milleniums. These terraces often include every foot of land as far as 2,000 feet vertically up the mountain side, although citrus fruits are rarely grown above one thousand feet.

PRUNING.

It was in the early part of May, just a year ago that I visited this region and I was not a little surprised when I saw how strangely the trees were pruned, being trained along horizontal trellises more like dwarf Scuppernong grape vines than like any citrus trees I had ever seen. They showed a healthy, green foliage and below the trellises hung not a few fruits ready to pick, as was evidenced by the groups of peasant girls carrying on their heads large baskets down the winding mountain roads to the villages below, where women and children were sorting and packing on the stone floors of the warehouses. Again, I was surprised at seeing that these fruits, smooth and just the right size to pick, were colored as if fully ripe. I afterwards

learned that the second crop, which is picked in winter and spring, is always colored both on the mainland and in Sicily; while the principal crop, ripening from October to December, consists, as with us, of green fruits picked according to size alone.

In many gardens irrigation is practiced, mountain brooks being deflected from their beds and led along ditches on the terraces to furnish water. Between the trees various vegetables are cultivated, and that danger from cold was not wholly absent was evinced by the covering of boughs spread over the trellises in many gardens. The terraces were constructed of thick masonry walls having sections laid without mortar to provide for drainage and for ventilation. It is said that the planning and construction of these terraces is an art so difficult that certain families only are able to undertake it and have followed the trade for centuries. The price of land in Sicily suitable for planting lemons runs from $400 to $1,200 per acre, and I feel confident that such terraced and irrigated land as that near Amalfi must be worth at least $1,000 an acre and probably much more.

The trees, as stated above, are trained horizontally, the system being apparently to tie down the long upright sprouts formed during each growing season, until they acquire a set, and then cutting the ends away. This bending and pruning has the effect of favoring the the formation of fruit buds.

One could see but few orange trees in this section, and such as were seen showed by their hungry look that they were there only on sufferance. Thousands of orange trees have been budded to lemons since Florida competition became severe, till now the orange production is very much less than that of lemons in all of the principal citrus growing regions of Italy except a small section about Rodi on the Adriatic shore, where the oranges are as celebrated as are the lemons of Majori.

In Sicily, so far as I can learn, the trees are not trained horizontally, yet they are still pruned considerably and are kept well in control.

SECOND CROP.

The land there is so dry in many places that irrigation is absolutely necessary. This enables the growers to produce a late crop of fruit called "verdelli" which are picked green from June to August when prices are high. To secure this crop they withhold water during the summer and then irrigate heavily and cultivate thoroughly early in autumn, which causes the trees to bloom. Owing to the fact that this abnormal flowering (to be compared with our "June bloom") is said to injure the health of the trees, the grove is divided into halves which are forced on alternate years, giving "verdelli" every summer as well as the regular autumn and spring crop.

UTILIZATION OF CULLS.

One of the most important factors in successful lemon culture in Italy that we have heretofore neglected almost entirely, is the economical disposal of the culls. Oversized fruits are halved and packed in casks in layers alternating with coarse salt, and when no more can be packed in, sea water is added to fill in the interstices. Of these salted lemons used largely by confectioners no less than 12,000 tons were exported to the United States in 1894 and the total production was nearly twice this quantity. The undersized lemons are more especially used in the prep-

aration of essential oil, used all over the world in perfumes, cooking, etc., and in the preparation of condensed lemon juice sold principally in England. Machines have been invented which grate and press gently the peeling, much as is done by hand; and one factory near Messina has no fewer than fifty-four of them, using 500,000 lemons daily. The juice is extracted by powerful hydraulic presses and boiled in vacuum pans to one-sixth or one-tenth of the original volume. A thousand lemons produce about fourteen ounces of oil, each peel yielding about ten drops. One pipe holding one hundred and thirty gallons contains the concentrated juice of almost 130,000 lemons. I am convinced that it is largely to these economies that the wonderful success of the Italian lemon culture is due.

COST OF PLANTING AND MAINTAINING.

The cost of planting a grove with buds two feet high inserted on three year old sour stocks is estimated at from $90 to $125 an acre, two hundred trees costing thirty-five cents each being set to the acre. The annual cost of fertilizing and cultivating has been estimated at forty to fifty cents a year per tree, which would amount to nearly $100 per acre. As to the cost of irrigation I have no idea. It will be seen at once that these amounts seem excessive to us and appear doubly so when we learn that labor is paid from twenty to thirty cents per day, never exceeding fifty cents except for the overseer, and sometimes being as low as fourteen cents. In the neighborhood of Cantania trees twenty-five years old are said to produce on an average 1,000 fruits per tree, while full-sized trees bear from 3,000 to 3,500. The total crop of Italy was estimated for 1895 at 10,000,000 boxes of which 4,000,000 (less than one-half) are exported, 3,000,000 coming to the United States.

Of diseases and insect pests the Italians have their share. In Sicily black and white scales are very abundant, necessitating hand cleaning of the fruit with brushes and sharp pointed sticks; and a gray fungus related to our sooty mold follows the attacks of another insect. They do not, however, have the dreaded scab which seems to exist in Florida alone of all the lemon producing countries, although originally introduced from Japan.

Freight rates are very low, the charges from Messina, Sicily, to New York being only twelve cents per box on fruit, and for salted lemons $2.07, a pipe containing 3,000 fruits. On the whole, considering the immensely high value of land and the enormously greater distance from market, I do not think the competition with Italy so serious as to render lemon production unprofitable even without a tariff, and with a moderate tariff sufficient to cover the difference in freight rates success is almost certain in south Florida.

LEMONS IN CALIFORNIA.

Turning to our own country, California demands our notice first because of the enormous development of the lemon industry there during the past decade. It is now estimated that in 1900 the crop will be 600,000 boxes, and that very shortly the entire market of the United States can be supplied. Lemons are picked at all times, but the main crop is matured in autumn.

Of diseases, one known as the gum disease causes some complaint, and a rust mite, or a mite akin to it, is abundant in

some groves. Scab is absent so far as known at present.

In the future the competition with California is likely to prove of more consequence than that with Italy, but in the long run cheap land, abundant summer rains, and nearness to market, are factors bound to render Florida growers able to command at least a considerable share of the market.

IN FLORIDA—DRAWBACKS.

Turning our attention to Florida, after considering the immense importance of lemon culture in Italy and its rapid development in California, we are surprised to note how little attention is paid to it here. In view of the fact that lemons of the very finest quality, often realizing the highest price of any in the market, have been grown in considerable quantity in the State, it is evident that there must be some drawbacks which prevent a more rapid development of the industry. I think we may safely say that these drawbacks are; first, danger of freezes; and second, the scab. Regarding climatic conditions, I do not consider that these present any serious obstacle to lemon growing, at any rate in the southern half of the peninsula. The greater tenderness of the lemon is largely due to its habit of growing at all seasons, and if sour stocks are used, which are desirable for other reasons as well, this tendency is in part, at least, counteracted. Moreover, the great danger from cold as compared with the orange is in part compensated for by the fact that the fruit is matured in summer and fall and is entirely removed by the time there is any danger of frost, rendering loss of crop impossible. Then even if the lemon were much more tender than it as a matter of fact is, there are hundreds even thousands of square miles of land with lake protection and in the southern third of peninsular Florida, where during even the severest freezes the lemon and lime are not seriously injured.

SCAB AND ITS REMEDY.

The other deterrent which has acted powerfully in preventing more general extension of the lemon industry here is the verrucosis or scab. This malady is due to a minute parasitic fungus undoubtedly introduced from Japan, probably on the Satsuma orange. It requires a moist climate in order to spread rapidly and hence is absent from California. Two years ago, with the co-operation of Mr. Sampson, Mr. Buffum, and other lemon growers, an extensive series of experiments in preventing this disease were conducted. Many of the treatments were either too costly or were injurious to the trees, or failed to prevent the disease; but spraying with ammoniacal solution of copper carbonate proved an effective and a reasonably cheap remedy.

It should be applied first when the young fruits are exposed by the falling flowers. The second spraying should be made usually after two or three weeks; a third, two or three weeks later when blooming is nearly or quite over; and a fourth, when the young fruits are of a size ranging from that of a pea to that of an olive. Thereafter a careful watch should

*It may be prepared as follows: Take five ounces of copper carbonate and stir up with about a pint of water to a thick paste; then dilute with one and one-half gallons of water in a wooden pail. Stir vigorously and at the same time add slowly two pints of strong ammonia (aqua ammonia fortior (28 per cent) of druggists) or five and one-half pints of weaker ammonia water (aqua ammoniae (10 per cent) of druggists). Stir until all is dissolved, or at least all but a few granules, and then dilute with water to fifty gallons.

be kept, especially after moist weather, and if little warts appear another application may be made. This treatment properly made prevents scab almost entirely.

PREVENTION.

One fact of great importance was developed during the course of our investigation, namely, that the removal of all diseased fruits from the trees and ground underneath was a preventive measure of the highest importance and even in the absence of any other treatment greatly lessened the number of badly diseased fruits. The importance of this hygienic measure cannot be too strongly urged, and I feel confident that in connection with three or even two sprayings it would reduce the number of unsalable fruits to insignificance.

In this connection it might be mentioned that scab does not occur on the lower Keys nor as yet at Biscayne Bay; and the very dry climate there during winter and spring, while in some respects a hindrance to lemon culture, would be a great advantage in checking the spread of the parasite if it should be introduced.

In addition to the direct treatment both hygienic and remedial outlined above, there are other ways I think the ravages of this malady can be so reduced as to render it no longer of any serious consequence. In the first place I would advocate the utilization of culls as is done in the manner described above in Sicily. Lemons so distorted by verrucosis as to be totally unsalable often are full of juice and have a rind replete with ethereal oil. Large growers should certainly own a Serravallo oil extracting machine and a vacuum pan for concentrating the juice. This latter could also be used to advantage for preparing lime juice now produced in enormous quantities in Montserrat. I believe in the future it will be found advantageous to grow limes and lemons in conjunction, wherein Florida is particularly favored over most other lemon growing countries. The Americans, moreover, use fresh limes much more freely than the Europeans, and if a process of curing can be found which will prevent the quick rotting which now occurs as soon as the fruits reach the markets, the lime fruit trade is capable of extensive development.

In Italy and California lemon trees are trained to shape from the time they are planted and are pruned also to some extent to induce fruit bearing when mature. It is probable that we have something to learn in this regard.

As to varieties, we already have very good ones, and by cross breeding and selection, such as we have already begun at the Sub-Tropical laboratory, I hope they may be still further improved. In particular, I hope we may be able to secure earlier varieties which will reach the market at the time of the greatly increased demand during the hot months, at the time when the Italian crop is largely exhausted. It is perfectly feasible to secure blood lemons if they are desirable by cross breeding with the Citrus Australis sanguinea of Queensland.

MARKETS.

As to markets for the output, it must be remembered that the home production does not by any means supply the demand, and that importations of lemons have averaged in value for the quinquennial period ending June 30th, 1896, the enormous sum of $4,557,108 annually, an amount exceeded by only one other fruit

—the banana ($4,932,390), and then but slightly. Even if the production of the California groves should reach in 1900 the total of 600,000 boxes, as predicted by one grower, this amount would still be insufficient to supply even the present demand, to say nothing of the then larger demand due to increased population. Moreover, the Florida crop begins to reach the markets when only the expensive "verdelli" are obtainable in Italy, and is largely marketed before the main Italian crop is ready to ship. As already mentioned, by obtaining still earlier varieties this advantage might be increased. In view of these facts any danger of over production must be considered as too remote to be worth notice at present.

In conclusion I would strongly urge that more attention be paid by Florida growers to lemon culture. It requires more skill, it is true, than any other citrus industry, but it yields larger returns. I look forward confidently to the time when the lemon crop of this State will equal in value that of the orange or grape fruit.

ORCHIDS.

Interesting Facts as to their Beauty, Habits and Culture. List of Varieties Best Adapted to Culture in Florida.

Paper prepared and read by Theo. L. Mead, of Oviedo, Fla.

[SEE MINUTES PAGES 1 TO 5 ITEM 19]

Mr. President, Ladies and Gentlemen: I have selected the natural order of orchids for my talk today and hope to make you share in the fascination which these plants exert upon those who study them closely. They are of small merely material use to mankind—the fragrant vanilla and one or two medicinal products of small importance are their only contributions to our physical wants, but by their strange and wonderful beauty of flower they have won the regard not only of civilized man but are highly prized and cherished by many so-called savages, who so appreciate the beauty of wild orchids growing near their huts that they refuse to part with them though offered the most tempting bribes by European collectors.

While we may find as great diversity of habit and ways of growth among the orchids as among most other plants, yet as a whole they form a very natural group, that is one whose members may be distinguished almost at a glance from members of other orders; and our first attempt in getting an idea of this group will be to locate them, so to speak, among their nearest allies. To begin with, they are endogens—the section across a stem shows woody threads scattered irregularly

through a pithy substance and no distinction between bark and wood. This of course makes it impossible to multiply orchids by grafting and budding as is so easily done in the exogens where the life and growth of the stem is concentrated and localized in the inner bark. The highest endogens are the palms and the lowest the grasses. Midway between these extremes we find a large group of natural orders including the pineapple family, the amaryllis, the iris, the banana, the canna and the orchid family. The cannas in particular will give us a hint as to how the orchids have come by their peculiar structure of flower which at first sight seems to be five-parted and so quite at variance with the rule of threes and sixes which one comes to expect as a matter of course among all the endogens. The fact is that the sets of three are really present in the five-parted orchid flower but so transformed that it requires dissection and the microscope to trace the changes and combinations that have taken place. If you will examine a canna flower you will find that the stamen has apparently become a petal, bearing pollen on one edge. In the orchid two stamens have not only become petals and lost their pollen altogether but have combined with a third real petal to form the so-called lip of the flower. Perhaps you will wonder how anybody can tell that this is what has happened, and this is the way the matter has been reasoned out. Each separate part of a flower has to have a special conduit for its nourishment very much as an arm or a leg needs its special artery for its support; these conduits in flowers are characterized by groups of spiral vessels which are easily recognized and orchid flowers have fifteen of them, corresponding to five whorls of three. The characteristic so-called column of the orchid flower which bears not only the stigma and hence is the pistil, but also the stamen or stamens, has no less than seven of these ducts and is considered to be all that remains of three pistils and four of the six stamens which the remotest ancestor of the orchid tribe is believed to have possessed. Occasionally single plants are found in whose flowers partial reversion to the ancestral type has taken place and the two sides of the lip appear as separate petal-like organs or three stamens are present at the extremity of the column instead of one, and these monstrosities confirm the ideas that botanists had gained by dissection and comparison.

There are two great groups of orchids, the members of the first including all the cypripediums or ladyslipper orchids, having two stamens, the latter only one. The ladyslipper orchids are widely distributed over all lands and climates yet the most of the species are local and rare, and give the impression that this great group of orchids is in the gradual process of extinction. Indeed it is quite probable that one or two species already survive only in green houses, and others may disappear from their native countries where they barely held their own until the advent of the ruthless orchid collector. On the other hand the hybridizers of the genus have gone at their work so enthusiastically and successfully that the number of distinct hybrid forms now grown in greenhouses—about 1,000—far exceeds the number of known species of the genus inhabiting the earth, and new varieties containing the mixed blood of three, four and even five species are constantly being produced.

Hybrid orchids are so highly valued

and their production requires such close attention and intelligent work, that careful memoranda have been kept in almost every instance so that the pedigree of most of these hybrids is as much a matter of record as that of celebrated race horses. Indeed only last year a catalogue was issued giving the names and synonyms and exact parentage of all the known hybrid orchids—some two thousand in number—and including the natural hybrids of which a few examples have been found growing wild along with the parent species.

The number of seeds produced by orchids is prodigious, but this shows rather an inferior organization than a superior one, and as Darwin points out, indicates not only low organization, but a poverty of contrivance, in great contrast to the wonderful adaptations which ensure the crossing of the flowers by insect agency, which I shall discuss later on.

The terrestrial orchids of northern regions, like the pogonias and yellow fringed orchids, common in our flat woods, have five or six thousand seeds to the pod, but the tropical tree-inhabiting species have far more. From an examination of several hundred pods which I have myself raised, I should estimate the average number at half a million seeds to the pod, and in a species of maxillaria, from South America, the pods have been estimated to contain a million and three-quarters, which, owing to the extreme smallness of the seeds, would be in bulk about a tablespoonful. A single plant of this prolific species often bears half a dozen pods at once, so that the children of one plant of this maxillaria, from the seeds produced in a single year, if they all reached maturity, would cover as with a continuous carpet 26,000 acres, allowing one square foot to every plant. The grandchildren of this one plant, again supposing all the seeds produced in one year to come to maturity, would crowd two plants into every square foot of the surface of the globe, land and sea alike, and leave enough over to similarly cover the moon and the planet Mars. It is perhaps hardly worth while to carry the computation on to the third generation, but if we imagine all the great-grandchildren of one single plant to survive, they would be enough in bulk to crush out every vestige of other life upon all three worlds under a solid mass of this maxillaria a thousand miles in thickness.

As on the contrary the number of plants of the species in any given district, seems to be about stationary, it follows that only one seed in ten millions succeeds once in every twenty years in becoming an adult plant, for if the successful seedlings were more than enough in number to replace the old plants that die from various causes, their total number would increase in geometrical ratio until the equilibrium was again restored.

An average orchid seed is shaped something like a grain of oats. It is about 1-80 of an inch long and 1-250 of an inch thick and it takes 20,000 of them to weigh a grain. Under the microscope the kernel is seen to be surrounded by a thin, nearly transparent husk. Being so small and light the breezes carry them almost like motes in the sunbeam, and on account of their numbers it would seem as though they must be carried to every possible situation for long distances from the parent plants, and doubtless this is the case. The seed, however, consists of an embryo only, with no laid up store of food for the germinating plant, and the processes of development are extremely slow and tedious.

When a seed has alighted in some suitable place, which must be damp, the kernel absorbs moisture from the surface on which it lies and slowly swells, after a week or two changing to a greenish color, and in the course of time assuming the shape of a boy's peg top. The upper blunt end then shows a tiny point in its center where ultimately a leaf will arise. At this stage the seed is about as broad as it is long, say 1-50 of an inch or less. Sometimes a whole year is consumed in reaching even this minute size, hardly visible to the naked eye. At other times other seeds apparently under exactly the same conditions as their neighbors will attain this peg top stage in two or three weeks and continue on what is called the thalloid state in which our peg top has spread out to a flattened disk perhaps 1-16 of an inch across with a few microscopic root-hairs on the under side, and after this a tiny leaf pushing upward from the center of the disk. Another leaf then appears in the axil of the first; when these two leaves are full grown and may be a quarter of an inch high, the first fleshy root appears from below the disk and our orchid has passed the perils of its infancy and has an excellent chance of continuing on to maturity. By this time a year at least has elapsed since the planting of the seed. In another year our aspiring plant will perhaps be an inch high and ready to push a second shoot or lead. So it goes on until perhaps in five years, perhaps eight, or perhaps not until the twentieth year, the plant is strong enough to bloom. Each year a new growth pushes from the base of the old one, a new set of roots is formed and generally an aged pseudo bulb, as these fleshy stems are called, withers away at the rearmost end of the creeping rootstalk. In favorable seasons a side bud may also push beside the leading shoot and this new lead also continues year by year to produce a blooming bulb; or if the creeping rhizome is cut apart without disturbing the roots, one or more of the dormant buds may start and eventually become separate plants. As this slow process is the only method of multiplying the individual plants, it is perhaps not to be wondered at that specially rare and beautiful examples bring such sensational prices when offered for sale. Five hundred, or in exceptional cases, even several thousand dollars are sometimes paid for plants of moderate size that show some unique beauty of flower while the perhaps equally beautiful but more abundant ordinary type of the same species may be purchased for a dollar or two.

Nearly all orchid fanciers nowadays are trying their hands at the raising of seed obtained by hybridizing different species, but the plants are so delicate in their early stages and so subject to attack by all sorts of insects and moulds or parasitic fungi, so apt to be smothered by algae or other low plants to which the constant moisture necessary for the seedling, affords conditions for luxuriant growth, that a hybrid orchid is always a prize and generally a source of pride and self-congratulation to its fortunate producer. So far, I have succeeded in growing two or three seeds out of each million planted, but hope to do better than that some of these days.

The mode of germination of which I have spoken, the seed passing through an intermediate or thalloid state before the appearance of leaves or roots, is not without parallel among other orders of plants. The crinums or so-called lilies of our gardens produce fleshy bulb-like seeds which

in germinating push out a sprout the end of which buries itself in the ground and swells into a genuine bulb, often as large as the seed it comes from, before sending a shoot up into the air. The orchid simply omits the needless sprout and gradually becomes a sort of tuber without altering its position.

We may consider the epiphytal or tree-inhabiting orchids as having been crowded off the ground by the fierce struggle for standing among terrestrial plants and finding space suitable for growth upon the branches of the forest, they have left the vulgar competition of more earthly things and established themselves among the winged fairies of the air, visited only by butterflies and bees and such ethereal creatures.

But you must remember that no real solidity of character can be acquired by a man or plant without effort and struggle and the wresting of the good from surrounding evil.

Let us see what has happened to the orchid tribe in consequence of being restricted in companionship to these idle creatures of the air. The flowers it is true have responded in the most wonderful way to the stimulus of insect visits and service of carrying pollen from one plant to another, but the flowers are simply necessary preliminaries to seeds and the seeds themselves offer no reward to any creature for their planting and distribution. They are so small that no creature cares to gather them and none of the larger animals could get at them in any case.

Let us have the orchids for a moment, as they retire from competition, and betake themselves to the fastnesses of the air and see what some of their competitors were doing down below. Let us take for example the ancestor of all the grasses; this humble plant was plumping up its tiny kernel with a little store of starch and gluten and thus becoming a prey to mice and other creatures who gathered more than they could eat of the best kernels and thus distributed the plant in favorable situations which otherwise it could not have reached. These favored plants again offered better kernels and more tempting inducements to their despoilers, returning good for apparent evil and receiving back the good they did in heaped up, pressed down and overflowing measure till now the grasses are dominant everywhere from the equator to the Arctic snows, as bamboos overtopping all but the loftiest trees and as wheat and other grains, supporting whole races of men, and in return having millions of acres devoted to their exclusive use. The orchids on the other hand have given honey and sweet, pulpy morsels to the bees and butterflies, and in return have become miracles of delicate beauty, but having done nothing for more intelligent and higher creatures, their seeds have scarcely advanced upon the windsown spores of the ferns and horsetails that flourished ages ago in the carboniferous time; in spite of their myriad numbers, they are so little efficient in perpetuating their kind that we value most orchids as greatly for their rarity as we do for the rare beauty they have acquired in doing good in the limited sphere where they had opportunity, for it is thought nowadays that variation is in response to stimulation that the visit of the insect causes a freer flow of sap to the parts thus irritated, and this fuller nourishment renders possible the change and enlargement which by slow accumulated degrees

have given us the beauties and marvels of which I am about to speak.

With hardly any exceptions orchids have adapted themselves to cross fertilization by insects, and in the whole tribe of ladyslipper orchids one general plan prevails, which is illustrated by the flower I hold in my hand.

The stigma is a broad button-like projection facing downward; on either side of this is fixed a mass of pasty, sticky pollen and around the whole is thrown the curious pouch with a fancied resemblance to a slipper. Some secretion is produced within this pouch which is attractive to certain small kinds of bees. These creatures enter the pouch by the large opening in front but are unable to come out in the same way, because the upper edges are turned over and act very much like a fish trap which the fish con enter but cannot leave. The bees, finding themselves unable to climb out the way they came, are obliged to pass up through one of the smaller passages, above, at either side of the stigma, and the anther is so placed that their backs necessarily become smeared with the viscid sticky pollen. Flying off to another flower of the same kind they repeat the whole proceeding, but this time they press past the stigma, part of the pollen is rubbed off on it, adhering on account of its sticky viscidity and the flower is fertilized, while a fresh supply of pollen is smeared upon the creature as it escapes past the anther into the open air.

A slight modification is shown by one ladyslipper orchid which is a native of the Isthmus of Panama. The side petals—the strings of the slipper as a lady remarked on seeing them—are lengthened out in an astonishing way so as to be sometimes nearly a yard long, their use has been conjectured to be to act as ladders for snails and slugs which in passing in and out of the flowers fertilize in the same manner as the bees just described.

In all the other tribes of orchids the rule is that the stigma is viscid and a prolongation or attachment on the stigma called the rostellum, secretes a gum or mucilage which serves to attach the pollen to the visiting insect to be afterwards pulled off by the superior stickiness of the stigma in the next flower visited.

Perhaps the simplest case is in these dendrobiums where the pollen forms a little waxy mass kept safely under a hinged cap until the insect, having entered the funnel shaped lip and pushed its head against what I may call the mucilage cup, attempts to back out, in an instant the hinged cup flies open leaving the pollen mass in contact with the smeared head of insect to which it adheres quite firmly. When the insect enters another flower, this pollen mass which adorns its forehead easily pushes past the pollen cap of the new flower, since it was not attached to the insect until it had retreated a little from the position it had to take to get the honey and so is pushed directly into the stigmatic hollow, which is not only very sticky, but of such shape as to tend to scrape off the pollen mass when the insect tries to retreat. As it retreats the pollen is carried from the flower as before and so the work goes on.

In the cattleyas there are four separate pollen masses under the cap and each mass has a little bit of elastic tape attached to it. The tips of these tapes just peep out under the cap and are glued to the insect's head or back just as the single pollen mass of dendrobium is. Sometimes it happens that the insect carries off only

one or two of them leaving the rest for the next comer. Sometimes it may carry off all four and leave them each in a single flower, thus fertilizing four seed pods instead of only one.

In the genus orchis, from which the whole family takes its name, the pollen is in two masses shaped like inverted soda water bottles with a little sticky disk of membrane where the cork ought to be. So when the insect backs out of the flower he is adorned with two club-like horns sticking straight up from the sides of his head. But if he entered the next flower with the horns in this position they would be thrust back into the places whence they came and the flower would go unfertilized. To obviate this difficulty the little disk of membrane, while remaining fast to the insect, is contractile, causing the club-shaped pollinium to sweep through an arc of 90 degrees, always in one direction, that is forward, so as to be in exactly the right position to touch the stigma of the next flower. The movement requires about thirty seconds, thus giving the insect time to fly to some other plant instead of leaving the pollen on another flower of the same spike which is less favorable to the seed production than cross fertilization with pollen from another individual of the same species. Indeed many orchids are entirely sterile with their own pollen and in some cases the pollen is actually poisonous to the plant that produces it, though capable of fertilizing the flowers of any other individual.

In another species of orchid the pollinia, instead of having separate sticky disks are both attached to a single saddle-shaped plate. When the proboscis of a moth comes in contact with this, the flaps of the saddle instantly curl around it and hold it tightly, while the contraction again carries the pollen masses 90 degrees to the front. In this species there are two stigmas instead of one and the pair of pollinia are so disposed on their saddle as to leave pollen on both of them at once.

Some orchids require a little time for the viscid matter to set firmly upon the insect visitor. In these cases the nectar instead of being free in the nectary, is contained in cellular spaces which have to be broken into by the exploring tongue of the creature which is thus delayed long enough for the cementing to take place.

One species of ophrys has a little shining projection on each side of the base of the lip, which looks curiously like a drop of nectar, though really the flower has none to offer and I am glad to say that this fraudulent imposition on the part of this base and deceitful plant is frequently unsuccessful as only the unwary among insects are deceived and the majority of the flowers of this plant wither away unfertilized.

In pteristylis, an Australian orchid, two of the petals and one of the sepals form a hood over the column while the lip hangs out in front of this open door as a convenient landing place for insects. But the hinge-like base of this organ responds to a touch upon its tip as a steel trap responds to a nibble at the bait, the whole gangway swiftly rises, hurling the incautious insect into the flower and then closing the entrance like a door, remaining thus for half an hour. A narrow passage is left above for the escape of the insect, so placed and arranged that the insect will be duly smeared with glue and decorated with one or more pollinia before it can regain its freedom. Upon its visiting another flower it will be again imprisoned, will escape by

a human hair, a little drop of liquid is shot out almost with a little explosion. In two or three seconds the drop sets hard, cementing the pollinia to the intruder, The insects alight on the lip of the flower and lick up the nectar slowly crawling up until their heads touch the sensitive crest. This then explodes and the pollenia are then instantly cemented to their heads. A flap at the same time curves over the stigma protecting it from being fertilized immediately; after a lapse of a considerable time this flap curves away again thus making it reasonably sure that the pollen will be brought from some other flower.

In dendrobium chrysanthum the lip is very elastic like India rubber and the pollen cap has an elastic hinge so that when disturbed by an insects it springs away from its place scooping out the pollen mass and tossing it on the insect which has already been smeared with glue. If the insect happens to be very quick in making its retreat so that the pollen misses it, the pollen mass is caught upon a protuberance of the lip just below, and the elasticity of the lip is such that as the insect effects its escape the rebound of the lip tosses the ball of pollen up again into the saucer-shaped adhesive stigma and the flower is fertilized in spite of the failure to impress the services of the insect.

In the remaining tribe of the orchids, the vandeae, there are two pollen masses to each flower attached by strong elastic cords to the pedicel which connects them with an adhesive disk. So the pollen of one flower can fertilize at most only two others and usually it fertilizes but one. As Darwin suggests, it is a precious object which the plant cannot afford to waste, and the strong elastic cords serve to prevent the pollen from being torn off during the narrow passage way, the pollen will be left upon the stigma and the fertilization will be thus affected. One observer cut off this trap door arrangement from a dozen flowers so that visiting insects were not compelled to crawl through the narrow passage provided for their escape and not one of those flowers produced a pod.

A Guatemalan orchid, the sobralia, keeps an unlicensed dram shop for its customers, which seem to be bumble bees. A bumble bee entered a flower of this showy orchid growing in a British hot house; when she emerged the large pollen masses were sticking to the middle of the back near the tail. The bee looked about and seeing no other flower re-entered the same one, took another dram and soon returned, minus her decorations and in a disgraceful state of intoxication. She stretched out her legs and lay for a time on the lip of the flower as if dead, but finally recovered her senses and flew away.

In spiranthes, or ladies' tresses, a little orchid common in our flat woods, the pollen may be removed by a visiting insect as soon as the flower is open but the entrance is so narrow that the pollen cannot possibly be pushed back into one of the flowers. After a few days the column moves so as to give a wider space so that they can be readily fertilized. This insures the transfer of the pollen from one plant to another for the bees that frequent the flowers always begin at the older blooms at the bottom of the spike and work their way up to the just expanded ones at the top. Thus the pollen is carried from those at the top to the older flowers of the plant next visited.

In the twayblade, or orchid of our northern woods, when the crest at the tip of the column is touched ever so lightly, even by

the active motions of the usually pjowerful insects to which it becomes attached. The strength of these elastic cords is such that in artificially fertilizing a flower by placing the pollen on the stigma they are apt to be pulled out again if the disk and pedicel to which they are attached are removed, but Darwin notes that an insect would be apt to move off sideways and the friction against the sides of the stigma, together with its adhesiveness are together sufficient to break the cords and leave the pollen on the stigma; and I have further noticed that at the very front of the stigma there are two deep grooves or notches hidden until the anther has been removed, in which these threads catch when the insect moves off in the most direct manner so that the pollen masses must inevitably be stripped off inside the stigmatic cavity before the insect can regain his liberty.

We often find in this group of orchids the same peculiarity I have before mentioned that the masses rotate through a quarter of a circle after they have been detached so as to assume the exact position necessary to reach the stigma of another flower, but sometimes the motion takes several hours, thus making it quite certain that the insect will have flown to a different plant, for some of these orchids produce spikes six or eight feet long with hundreds of flowers, and it is a great advantage in the production of seed to have the pollen come from a distinct individual and not merely from another flower in the same spike. In some species the pedicel is so elastic that when first removed it springs straight upwards—thus tossing off the other cap whose protection is no longer needed and then slowly moves forward into position to fertilize the stigma.

In Madagascar there is a star-like white waxy orchid bloom whose nectary is a foot long and contains honey only at the extremity. This caused Mr. Darwin to predict that a sphinx moth with an immensely long proboscis—longer than anything the entomologists had dreamed of hitherto—would be found to be the carrier of pollen from flower to flower of this species. This prediction was ridiculed by some entomologists; nevertheless in due time the insect was thereafter discovered and found to act in the manner described. Some of the orchids of this tribe have thin, leaf-like pollen masses, the stigmatic chamber opens by such a narrow cleft that it seems almost impossible to insert the pollen masses even intentionally. They are left sticking by their edges in this cleft but as it opens out wider inwardly and the part of the sheet of pollen already inside swells from absorbing moisture the remainder is gradually pulled inside and swallowed up in the stigmatic cavity.

In another species where the stigma is an open cup-shaped cavity this begins to close over after the pollen has been left upon it and in a day or two not only has the opening entirely disappeared, but two arm-like appendages of the flower have also curled over it to hug the precious morsel tight and prevent any possible injury to it.

One orchid of the island of Trinidad is fertilized by a native bee which has a tongue twice as long as its body but as the orchid offers no nectar, but only sweetened pulp, the bee has to use its jaws instead of its tongue which is tucked away underneath its body and projects beyond its tail—in fact this is the sort of a tongue that could a tail unfold. The pulp is so placed that the bee has to back up to the

flower and the pollen becomes attached to the wriggling tongue tip to be transferred in due course to the stigma of another flower.

In coryanthes, another South American orchid, the part corresponding to the lip of other orchids hangs down like a bucket with a spout. Two appendages of the flower stand directly over the bucket and secrete so much liquid, which is almost clear water, that the falling drops fill the bucket and even overflow by the spout. This spout is closely overhung by the column so that an insect forcing its way out of the bucket through the spout would first brush against the stigma and then carry off the pollen masses. Above the bucket is a fleshy substance attractive and somewhat stupefying to bees which dispute with each other in great numbers for a place to gnaw this pulp, and partly by the contest and partly intoxicated, they tumble down into the bucket below, the water wets their wings so they cannot fly out and are compelled to crawl out through the spout. The first bee will have the pollen glued to its back and generally returns to the same or another flower leaving the pollen on its stigma as it escapes a second time. Sometimes there are so many bees assembled that there is a continuous procession of them through the passage.

The last example of cross fertilizing device to which I shall refer is perhaps one of the most remarkable of all. In the genus catasetum alone among orchids the male and female flowers are borne on separate plants though occasionally a plant may be found bearing both kinds on separate spikes and even a third variety of flower which is intermediate between the two, producing both pollen and ovules, but these hermaphrodite flowers are sterile and seem to be a reversion to the type of remote ancestors which like all other orchids bore perfect flowers. For a long time botanists thought the three kinds of flowers were not only separate species but belonged to different genera and were almost dumfounded when a plant turned up bearing all three kinds of flowers at once. The male flowers have a fleshy lip with a large cavity lined with crests of a sweet and nutritive pulp and overhung by a slender curling horn which is sensitive to the slightest touch, transmitting the irritation almost instantaneously upward to the anther which violently shoots out the pollen attached to a very large and very sticky disk which invariably lands with a resounding slap on the back of the unsuspecting insect—usually a hairy bumble bee, and sticks fast beyond any possibility of removal by any efforts of the insect. When the horn or antenna of the flower is touched by a bristle the pollen is thrown as much as a yard away and people touching the flowers in their hothouses often have the pollen thrown in their faces. This violent ejection and the unusually large amount of viscid matter on the disk ensures the pollen's attachment to the bristly hairy surface of the bee; no other part of the flower is sensitive except this horn and the flower may be freely jarred and poked and handled in almost any other part without disturbing the pollen, and the horn itself does not appear to move, so that it is not an action similar to the snapping of a trap when the trigger is meddled with but seems to be what for want of better name we call nervous impulse. If the tip of the horn is touched with a drop of boiling water or of sulphuric acid it is killed too quickly to respond, and the pollen remains in place,

but will be projected if the horn be irritated by a touch above the point injured by the heat or acid. In the corresponding seed bearing flower there is no horn and the anthers are rudimentary and drop off as soon as the flower opens and altogether it is of such a different appearance that it was natural to class it as belonging to a distinct genus before the facts were known.

In all other plants beside orchids the ovules are ready for fertilizing when the flower blooms but it is not so with orchids. The preparation of the ovules requires the expenditure of a large amount of nutritive material, and plant food is scarce where the orchids live, and the plant cannot afford to risk such a loss as would ensue if half a million ovules were developed and never fertilized. So the ovules do not begin to form until the flower is safely fertilized and has begun to wither away.

The pollen grains send out tubes which enter the stigmatic tissue and slowly grow downward for weeks and often for months before the ovules are ready for fertilization. In the genus vanda this takes place six months after the flower has faded; at that time the pollen tubes enter the cavity, coalesce with the ovules and the embryos begin to grow. Small as they are, even at maturity, their ripening requires twelve months more so that another crop of flowers has come and withered away for half a year before the first seeds are ripe.

After this review of the curious and wonderful characteristics of this group of plants I think you will agree with me that sober facts are stranger than fiction or the travelers' tales that have been written about these plants; though I will admit that a good many professional collectors and others have had robust imaginations on which they chiefly depended for accounts of their adventures. One tale recently going the rounds is entitled the Village of Demon Orchids and relates with much circumstantiality how the collector heard of a superb and incomparable orchid, acres of which grew together in constant bloom but giving out such an insupportable odor that every creature perished that attempted to approach them. He reached the spot but was obliged to survey the coveted prize from afar with a field glass, and even then hardly escaped to tell the tale. Of course there is not a word of truth in any part of this story. Another collector actually brought a very charming and new orchid, the eulophiella elisabethae from the interior of Madagascar, but to discourage any poaching on his preserves by other collectors, tells how as he journeyed towards the spot under the guidance of a native chief the chief's brother was pounced upon and torn to pieces by that terrible beast the protocryptoferox Madagascariensis. By the way, there isn't any such creature though protocryptoferox is the name of the small and comparatively harmless civet cat. Owing to the tribal laws the collector was immediately offered the choice between espousing the widow or being greased and burnt to appease the spirit of the departed. Being a gallant Frenchman he was incapable of slighting a lady and triumphantly proceeded with his new brother-in-law to gather all the plants and destroy what he could not gather—and he adds a hint that his truculent brother-in-law in Madagascar is quite ready to grease and burn any venturesome collector who may hereafter presume to poach upon his dear relative's preserves.

Perhaps the traveller's tale was suggest-

ed by the fact that an orchid collector was really carried off by a tiger while on a collecting trip in the neighborhood of Singapore and others have had to bargain with cannibal savages in New Guinea before being permitted to despoil their rocky burial places of a fine orchid that grew most abundantly in such localities.

CULTURAL DIRECTIONS.

The cultivation of orchids in Florida is not the difficult task that many people suppose. Some are as easily grown as geraniums though the treatment is not quite the same as that of ordinary house-plants.

Orchids mostly need a season of growth with plenty of water and a warm rather moist atmosphere, and a season of rest when they are kept cooler and dryer. Some bloom during growth, some at the beginning and some at the end of their resting season, so that by properly selecting the varieties, flowers may be had nearly all the year round from different plants needing practically the same cultural treatment.

The cypripediums or ladyslipper orchids need no resting time and should be watered abundantly all the year round. Cypripedium insigne is cheap and easily grown but prefers loamy soil; still a six-inch potful of soil will keep a good sized plant in good health for several years, if a little weak manure water is used occasionally. The flowers appear in December and last in good condition on t..e plant for two months. This is altogether the most easily grown cypripedium for Florida;its requirements are only proper soil, perfect drainage, plenty of water, half shade or other airy place and immunity from actual frost.

Phaius grandifolius the "Veiled Nun Orchid"—often catalogued as Bletia tankervillae—thrives in any rich mucky soil with an admixture of well decayed manure, either in pots or in a moist spot out of doors. Give half shade and protect from actual frost and it will grow like a weed. I had thirteen spikes this spring from a small outdoors clump, averaging at least a dozen flowers to the spike. This clump was protected during frosty nights by being covered with a blanket spread on a lath frame, on the coldest night—25 degrees—a lighted lantern was put underneath.

The other orchids which naturally live upon the branches of trees are best grown in fern-root. Blocks of wood on which they are often grown at the North are not advisable here; the roots are too much exposed to the ravages of cockroaches and they dry out too quickly. Besides the wood decays in a short time and decaying wood is rank poison to orchid roots of all kinds. Even cypress will not last more than a year or two when used for orchid baskets, and perforated flower pots are much better—with a little practice a hole 1½ or two inches in diameter may be chipped out of a five-inch pot by means of a sharpened nail and a tack hammer, and it will do as well as a perforated orchid pot made specially for the purpose. Galvanized poultry netting may be easily made into improvised hanging baskets. It will last better if painted and sprinkled with Portland cement while the paint is fresh.

For potting material nothing is better than the rootstocks and matted root fibres of the osmunda or "flowering fern" common in rich hammocks. Pieces of suitable size can be chopped off with a hatchet, the sand and earth shaken off and the orchid plants firmly atached by fine copper wire, if the plants are newly imported and without many roots; or, with already established plants, pieces of the fern root the size of an egg or larger can be placed in the new basket and after removing as much of

the old material as possible without seriously injuring the roots of the orchid, it may be firmly fixed among the fresh pieces of fern-root and the stems wired fast to prevent the plant from shaking about till the new roots have taken firm hold of the new material. The eyes at the base from which the new shoots are to come must not be covered, otherwise the new growth is likely to decay and the plant may be lost.

If the orchid is dipped daily in a bucket of water and hung up in half shade on a piazza or under a tree during the warm season, and dipped only once or twice a week after its growth has hardened up and until the new growths have become an inch or two two long, the next season, and if the plant is never allowed to be exposed to a night temperature of say less than 40 degrees, success may be expected with almost any cattleya or laelia, and many of the East Indian dendrobiums will succeed admirably. Avoid all orchids usually catalogued as "Cool orchids." They come from cool mountain heights and rarely survive a Florida summer.

Dendrobium nobile is perhaps the best tree-orchid for the beginner. I have had them grow for years attached to tree trunks out of doors and the flower buds have endured a cold of 21 degrees for a short time without injury but it will not grow in a really satisfactory way unless cared for as recommended above.

To the beginner I would recommend the following list as easily grown and giving a succession of flowers through the year.

Cattleya Trianae—Blooms in January.
Dendrobium nobile—February.
Dendrobium thyrsiflorum—March.
Phaius grandifolius—April.
Cattleya mossiae—May.
Laelia purpurata—June.
Cattleya leopoldi—July.
Cattleya bowringiana—August.
Laelia perrini—September.
Cattleya labiata—October.
Laelia anceps—November.
Cypripedium insigne—December.

The substance of this paper was delivered as a lecture before the students of Rollins College a short time before it was read at the meeting of the Horticultural Society, Anyone wishing to pursue the subject farther will find almost all the known facts related at length in Darwin's work "On the Fertilization of Orchids by Insects," published by D. Appleton & Co.

Mr. Taber: I quote from a letter of Mr. Mead written to me personally. He wrote me that he had not had time for five months to go to the station one mile away —just attending to his orchids. Mr. Mead is a scientific crank—but it is just that kind of scientific cranks that make this Horticultural Society what it is.

ORNAMENTALS FOR FLORIDA.

Best Varieties of Trees, Shrubs and Plants for Ornamental Purposes—Mistakes to be Avoided.

Paper prepared and read by E. N. Reasoner, Oneco, Fla., being the report of the Standing Committee on Ornamentals.

[SEE MINUTES PAGES 1 TO 5, ITEM 18.]

(President Taber: Mrs. Mary Lyman Phelps was the chairman of this committee. but on account of her death her name does not appear on the program.)

Mr. President, Ladies and Gentlemen: During the past three weeks I have been thinking what I should say on the subject of Ornamentals, and yet cannot suggest anything new. There are three very common and widespread errors made in planting that thrust themselves on our attention and demand a lessening.

1st. New places cleared of every vestige of plant life by contract.

2nd. Planting moisture-loving trees and shrubs on dry, thirsty soil, and vice versa.

3rd. Trying to get quick results in setting large stock at unsuitable times of the year.

We have all noticed these three mistakes frequently and perhaps are to blame for one or more of them ourselves. By all means every piece of land selected for a home place or a garden of shrubs, should be examined carefully, and all choice specimens of trees, shrubs or plants marked for reserve. Shade trees are necessary in our warm climate, and the best native oaks, bays, and other shade giving trees found on such land will be far better than many which could be set later. On our own two lawns are magnificent hickories, oaks and cabbage palmettoes from 25 to 100 years old already grown for us without waiting. Some of our neighbors on same kind of land cut off everything before building their houses and now are nursing small and sickly trees where giants formerly stood. A judicious thinning out, is, of course, necessary, if the trees are crowded too thickly, to allow more perfect forms and artistic after effect.

I have tried growing plants that naturally grew in water, or in moist spots, on dry land, and occasionally with partial success, but to do the best, we must set plants on suitable soil and try to follow nature's ways. People who live on dry ridges persist in trying to grow water lilies, and ignore cactus and succulents, which would thrive wonderfully with little care. The opposite is probably just as frequent, the heavy summer rains scalding or drowning

specimens on low land, that require perfect drainage and a dry top soil.

The third mistake is most often made by hotels and land companies, who try to turn a barren waste into a park or pleasure ground. "Haste makes waste" we will recall when we think of many such attempts as this. Just for an instance, I will mention the Tampa Bay Hotel where thousands of dollars were spent in vain in transplanting immense palmettoes, orange trees, etc., which are now only a memory. I do not say that large trees cannot be moved successfully, but I do say emphatically, that transplanting must be done at a proper time. Oaks will not live if set after they commence their spring growth, and all such trees should be moved early, preferably in December, so that root growth can be made before warm growing weather begins. In setting evergreens less cutting is necessary if leaves are clipped off. Magnolias, Bays and Loquats are prominent examples that should have every leaf removed in transplanting. Cutting to a good form and taking out small branches must be done with all trees and shrubs that require training.

There are five other points I will touch on that are pertinent to this subject. Tropical plants that sprout up readily after freezes. Ease in protecting plants by banking with soil. Setting tender plants deeply to ensure safety to adventitious buds during freezing weather. Native trees as a rule better for shade than exotic; and lawns and bordering hedges.

Among plants that come up readily again after being frozen are, Acalypha, Allamanda, Alocasia, Alpinia, Bauhinia, Bignonia, Bougainvillea, Caesalpinia, Cestrum, Clerodendron, Galphimia, Goldfussia, Habrothamus, Hamelia, Hedychium, Heliconia, Hibiscus, Ixora, Jacaranda, Jasminum, Justicia, Meyenia, Murraya, Nerium, Plumbago, Poinsettia, Tabernaemontana, Thevetia, Thunbergia and hundreds of others less known. This list can be indefinitely extended by following the next two suggestions: that of setting tender plants deeply, and banking slightly just before cool weather. In setting out any plant from a flower pot, it should be set deep enough to allow new roots to form above the ball of soil and to keep this ball down in moist earth. After being frozen to the natural level, such a plant will throw up sprouts from adventitious buds that were below the danger line.

As to my statement in regard to native trees being better than exotic, I will ask where are the thousands of Grevillias, Eucalyptus, half hardy Acacias and like trees, that were planted once so extensively? There are in every county of Florida as fine trees for shade or ornament as could be desired, which are too often neglected and attention given to inferior trees. To be sure, we want variety and choice foreign plants, but let the mainstay be our best natives, and plant less of those we know little of. There is no state of the Union that could show finer results if we gave more attention to our native growth, and I believe Florida people are more alive to this fact than they were before our two '95 freezes.

We have been trying St. Lucie grass on part of one of our lawns, and find it an excellent lawn grass. It is somewhat coarser than Bermuda, but similar in habit of growth. It is more easily eradicated, however, and thrives in both partially shady and sunny situations. A wide range as to moisture can be allowed also and watering is unnecessary, except on the highest and

driest white sand. If one commences watering it has to be kept up continually, as the roots are only on the surface; if on the contrary no water is given, the grass roots penetrate farther and resist drouth. Clippings of the grass and fallen leaves are best left on the surface as they form a mulch and in our cases we have found it satisfactory. We grow St. Augustine grass and find it unequalled for very shady spots; it requires less cutting than St. Lucie or Bermuda, and holds less dew, thereby being drier and preferred by many.

By all means grass of some good variety should be planted around every house. no matter how small an area is available, as it covers the bare sand, reduces temperature, and is beautiful if kept trimmed. The most beautiful and artistic boundary for a lawn is a well kept hedge, yet there is scarcely a good hedge of any sort known in Florida. Why we do not see them is a mystery to me, as we can grow so many choice plants in hedges here easily. Among the best subjects for ornamental are Chinese arbor vitae, European and Downy myrtles, Cape Jessamines, Oleander, Privet, Carolina laurel-cherry, various hollies and so on. For defensive hedges Citrus trifoliata, the hardy trifoliate orange is most excellent, also Paliurus aculeatus, the Christ-thorn of Italy. Both are very thorny, hardy and of easy growth. Clipping is necessary twice each year at first to keep the hedge in good form. Hedges of roses are handsome when kept up, but require different treatment than upright growing shrubs. We have never had much experience with them and would much like to see a really good one in South Florida.

THE NEW METHOD OF WARFARE AGAINST SCALE INSECTS.

Spraying—Fungus Parasites of the Mealy Wing—The Turtle Back Scale—The Purple Scale and Long Scale—The Red Scale—The Wax Scale Methods of Artificially Spreading Scale Insect Fungi.

Paper prepared and read by Prof. Herbert J. Webber, Special Agent, U. S. Department of Agriculture, Sub-Tropical Laboratory, Eustis, Fla.

[SEE MINUTES PAGES 1 TO 5, ITEM 50.]

GENERAL DISCUSSION.

In the development of civilization plants became gradually to be cultivated extensively. This concentration of numerous plants of the same kind in small territory led to the easy spread of diseases, and it soon became important to treat these, if the plants were to be successfully cultivated. Our ancestors were thus early led to the study of plant diseases, and the beginning of the science dates back several centuries. True, the methods employed at that time

in combatting diseases were primitive in the extreme, the extensive science of treating plant diseases, which we now have, having been developed in comparatively recent time, the greatest advance being made in the last fifty years. Before the spray pump was invented and before the extensive application of fungicides and insecticides was necessitated, poisonous materials were simply sprinkled on the plant with an apparatus similar to a whisk broom. In the development of the science the whisk broom gave way to the hand pump which was, indeed, an immense improvement. The first pumps used were largely of vertical action and were exceedingly tiresome to use. These have largely given place to the fine horizontal action pumps such as the "Gould," which are very much easier to work, and for small groves and gardens seem to be about all that could be desired. When spraying on a large scale these are being largely replaced by pumps run by water motors, gas engines, etc. In the same way the number and quality of fungicides and insecticides have increased until now we have almost countless numbers of mixtures.

Unfortunately, however, even with the improved apparatus and effective sprays which we have at the present time, it must be conceded that spraying methods are far from satisfactory. In large trees like the orange, where the foliage is dense, it is almost impossible to spray thoroughly enough to make the treatment effective; indeed, in serious diseases spraying becomes so tedious and expensive that it is doubtful whether the grove will pay for the trouble. This has led many to seek aid from other sources, particularly in the treatment of insect diseases. Entomologists have looked mostly to their own field for aid and have studied mainly insect parasites of the pests concerned, and not without reason. The majority of scale insects are attacked by insect parasites which feed upon them and in some cases greatly aid in keeping them under control. The long scale of the orange, for instance, is quite commonly parasitized by a hymenopterous insect which ultimately kills it. The lady bird beetles, which prey upon the young of the scale insects are also known to destroy great numbers of them. There is, however, considerable doubt whether the lady bird is as effective as is commonly supposed, particularly in the case of the long and purple scales. One of the greatest advances which has ever been made in the treatment of scale insects was the introduction into California from Australia of the Vedalia cardinalis, an enemy of the cottony cushion scale. From all evidence which we have on this subject it would seem that the Vedalia has exceeded expectations and has proved capable of keeping the cottony cushion scale in check. Much may undoubtedly be gained by the introduction and artificial spreading of parasitic insects of this sort. There is, however, still another and perhaps a more promising method of fighting insect pests. The new method of fighting scale insects, to which I desire to call your attention, is the introduction and spread of their fungus enemies. This is not altogether a new idea; indeed, much study has been devoted to treatments of this nature, but in the majority of cases without much success. No particular attention, however, has been given to the fungus enemies of scale insects. The grasshopper is affected by a fungous disease which in many cases is fatal; the chintz bug which causes such great damage in wheat and corn fields in the west, has been very successfully treated by intro-

ducing and spreading one of its fungus enemies; hosts of other insects have their fungus pests, and it would thus be surprising if among the large number of scale insects we did not find a number of fungus parasites. Since coming to Florida I have made a careful search for parasitic fungi attacking various scale insects and have found that almost all of our orange scales are attacked by one or more species. In the case of the mealy wing or white fly, which I have studied very carefully because of its association with the sooty mold, I have found two fungi which bid fair to be exceptionally effective.

FUNGUS PARASITES OF THE MEALY WING.

In a paper read before this Society last year I described a mealy wing fungus (Aschersonia aleyrodis) which attacks the mealy wing (Aleyrodes citri) in the larval and pupal stages. This fungus I have observed to be very abundant in groves infested by the mealy wing at Bartow, Crescenty City, Gainesville, Manatee, and Myers. I have also learned that it was becoming very abundand, before the freeze, in the groves at Panasoffkee. It forms little whitish pustules which grow up over the scale and entirely conceal it. In the later stages of the fungus it forms great masses of coral red spores in depressions on the upper surface, so that in this condition it presents a very striking appearance and might be called the red mealy wing fungus. In many groves affected with the mealy wing this fungus has become so abundant that usually from one-third to one-half of the insects are killed, and from the testimony of several grove owners it would appear that the sooty mold has in several regions been greatly decreased since the introduction of the fungus.

A second fungus parasitic on the mealy wing was found at Manatee last year and was mentioned in my paper, read before the Society at its last meeting (Report Ninth Annual Meeting, p. 74). This has since been commonly called the brown mealy wing fungus, which distinguishes it from the above described Aschersonia. It also attacks the mealy wing in the larval and pupal stages and grows up over the scale, forming a dark brown disk somewhat similar in appearance to the red scale (Aspidiotus ficus). The pustules are about 2 m. m. in diameter and one-half m. m. high. From the base of each pustule numerous filaments of the fungus radiate in each direction on the leaf, extending frequently to a distance of half an inch. These basal filaments infect other larva with which they come in contact; thus when once the fungus is introduced on a leaf, if there are very many of the insects present it spreads over the entire surface infecting and killing every insect within reach. It also spreads very easily from leaf to leaf, so that in many trees where the fungus has developed it is almost impossible to find a single living insect. I first discovered this fungus in the Viser grove (of five acres) at Manatee, Fla., in March 1896. At this time it was limited to about half of the grove and had become abundant on only a comparatively few trees. In December of the same year the grove was again carefully examined. The fungus had spread over the entire grove during the summer and had become so abundant that it was almost impossible to find a single living insect in the grove. The fruit, which for a number of years had been very black with the sooty mold was entirely bright and required no washing. The new foliage developed during the later part of the rainy season, which under former conditions

would have been covered with the numerous larvae of the fall brood of mealy wings, remained so free from the pest that it was only by persistent search that an insect could be found. The action of the fungus in the Viser grove during this season was as effective as could be desired. During the summer the fungus had also spread rapidly to adjoining groves, having been introduced into almost every grove within a radius of a mile. On first discovering the fungus in the Viser grove the writer made a careful examination of other groves in the vicinity, but was unable to find any trace of the fungus in any other place, so that the rapid extension of its territory occurred mainly if not wholly during the summer of 1896. It cannot yet be determined whether the brown fungus will prove as thoroughly effective in other years. Its spread in 1896, however, is in every way encouraging, and it would seem that we have at last a successful means of combatting our most dreaded enemy.

FUNGUS PARASITE OF THE TURTLE BACK SCALE.

The turtle back or soft-shelled scale, as it is sometimes called, (Lecanium hesperidum, Linn.) is also occasionally parasitized by an Aschersonia similar to that attacking the mealy wing. The spores differ in color, however, and it is unquestionably a distinct species. It was first found at Myers, Fla., in 1886. This scale seldom causes serious damage, and no attempts have been made to spread the fungus artificially. In the place where it was found it had almost entirely killed out the colony of this scale.

FUNGUS PARASITES OF THE PURPLE SCALE AND LONG SCALE.

When these two scales (Mytilaspis citricola and M. gloverii) were first introduced into Florida in the early days of the orange industry, it is commonly reported by growers that they were exceedingly serious, frequently killing the trees and causing injury to such an extent that it was feared that citrus growing would have to be abandoned. Gradually, however, the numbers of these pests have become reduced until now they seldom cause serious damage. This gradual decrease in the damage they were doing, I feel sure, was caused by the increase of their natural enemies which now under ordinary circumstances succeed in keeping them entirely in check. Under certain conditions, however, they still become abundant and cause serious damage.

These two scales have frequently been found parasitized by a small grayish fungus (Ophionectria coccicola), but it was not until recently that we had any suspicion that the fungus had any material effect in keeping the scale under control. The lady bird beetles and hymenopterous parasites which prey on these scales, it was supposed, were the entire cause of their lessened numbers. Results obtained in extensive spraying experiments with fungicides, however, have recently led us to believe that the above mentioned fungus is exceedingly important, if not the main factor, in keeping these scales in check. Extensive spraying experiments were conducted by Prof. Swingle and myself at Boardman, Stanton, and Citra, using the Bordeaux mixture and ammoniacal solution of copper carbonate, two fungicides, in treating scab and melanose. In all of these spraying experiments certain rows were sprayed and adjoining rows were left unsprayed as checks. On the sprayed rows the purple scale increased so rapidly that the trees were seriusly injured. This led to an examination and it was found that the Ophionectria was very abundant on the unsprayed rows, while on

the sprayed rows very little or none could be found, and the scale was increasing with great rapidity. The lady bird beetles were apparently as abundant on the sprayed rows as on the unsprayed, but did not succeed in keeping the scale in check. Evidently the fungicides used for the scab and melanose had the effect of preventing the spread of the scale fungus on the sprayed rows, thus allowing the scale to increase without interruption. These experiments we think, show conclusively that the Ophionectria is exceptionally effective in controlling these scale pests. On certain of the Keys this fungus has apparently not been introduced, and in such places it has been found almost impossible to grow citrus fruits. In the winter of 1895, the writer observed a lime grove on Key Largo where almost every tree had been killed to the ground by the purple scale. According to the testimony of the owner it had been found impossible to grow limes and lemons successfully. It is probable that by introducing the Ophionectria here the scale would be prevented from increasing rapidly enough to cause serious damage.

Since the freeze the purple and long scales have become abundant in certain places where the fungus has been killed out, or at least seems not to have appeared yet. Measures should be taken to introduce the fungus into all groves where it does not occur.

FUNGUS ENEMIES OF THE RED SCALE.

The red scale (Aspidiotus ficus), which is probably the worst scale insect which we have affecting citrous trees in Florida, also has its fungous enemy. In the Hiawatha grove at Maitland, Fla., where before the freeze the red scale was very abundant, the writer in 1894, found a parasitic fungus, bursting out from underneath the scale, to be very abundant. Careful search proved that the fungus was exceedingly effective, fully fifty per cent of the insects in the grove having been killed by it. The same fungus has been found in several other localities where the red scale is abundant and it will doubtless prove an important aid in keeping this serious pest in check. The mature stage of the fungus has not been studied and its name cannot thus be given at the present time. It is however, related to the Ophionectria which infests the long and purple scales.

FUNGUS PARASITE OF THE WAX SCALE.

The wax scale (Ceroplastes floridensis) is frequently attacked by an Aschersonia (A. turbinata) quite similar to that affecting the mealy wing. One instance has come under my observation where a comparatively severe epidemic of the wax scale was checked by this fungus. In the Crescent Grove at Citra, Fla., in the summer of 1894, the wax scale became very abundant and caused considerable alarm. The manager was preparing to spray to keep the pest under control when the Aschersonia was discovered on a few trees. It was decided to determine the efficacy of the fungus, and spraying was abandoned. The fungus spread rapidly, and when the writer examined the grove in November of the same year it was almost impossible to find a living wax scale.

METHODS OF ARTIFICIALLY SPREADING SCALE INSECT FUNGI.

In the case of the mealy wing Aschersonia and the brown mealy wing fungus careful experiments have been made to determine how they may be introduced into groves where they do not occur. The first experiments were made in mixing the spores with water and sugar solutions and spraying them on the uninfected scales. This meth-

od, however, proved ineffective. A number of experiments were then made in attempting to introduce the fungus by simply hanging twigs which harbor larvae infested with the parasitic fungi, in trees where the healthy mealy wing larvae were abundant. Many failures, however, followed the use of this method and it cannot be relied upon as sure of success. Other experiments have been conducted in attempting to introduce the fungi by transplanting small nursery trees harboring infested larvae. By using this method the natural means of dissemination is allowed to act and it is believed that it can be relied upon as almost certain of success. It is important to plant the trees in such positions that the foliage mingles with the foliage of the trees on which it is desired to introduce the fungi. It is important that these two fungi should be introduced as early as possible into every grove in the State which is infested by the mealy wing.

No special experiments have been made to determine how the other scale insect fungi mentioned can be artificially spread. It is probable, however, that the method used in spreading the mealy wing fungi would prove effective in spreading these also. Ophionectria, which attacks the long and purple scales, can probably be introduced by means of artificial cultures, but no experiments have as yet been made to determine this.

PINEAPPLES.

Fancy Varieties—Control of Time of Fruiting—Advantages of Cover.

Paper prepared and read by Geo. I. Russell, of Orlando, Fla., of the Committee on Tropical Fruits, With discussion following.

[SEE MINUTES PAGES 1 TO 5, ITEMS 51 AND 52.]

Mr. President, Ladies and Gentlemen: So much has already been written on pineapple culture, and extracts of my article prepared last fall for the Orlando Board of Trade having been published in almost every agricultural paper in the country, I am at a loss how to prepare a paper acceptable and profitable to the Horticultural Society on this subject without being accused of plagiarism.

I have not dealt very much heretofore on the immense strides that have been made in the business, and so shall ask your indulgence while I point out a few facts which should be an inducement to every farmer and fruit grower in the State to embrace the culture of the pineapple.

The profits from a pinery exceed almost one hundred per cent the profits from almost any other fruit raising industry in the world. I do not refer to the common varieties of the fruit which are used almost exclusively for canning, and with which the grower has to compete with the imported

fruit at a two-cent tariff. I refer to our fancy varieties, with the immense six to twelve pound pines that have made Orlando famous.

I have had friends remark to me, "Why do you advise people to go into a business which you practically control?" My reply has always been and is the same today; "If two-thirds of the available land in the State of Florida was planted in pineapples, the product would not meet the demand for the fruit of the better varieties in the markets of the United States alone.

This statement is made only after careful investigation, and I find that where the public taste has been educated to the consumption of our finer grade pines, retail dealers will not handle the cheaper and coarser fibered varieties.

Regarding the varieties, I am often asked by people who are about to enter the business, "What varieties do you advise me to plant?" The question is difficult to answer; a great deal depends on the market the grower intends to supply I have here six plants in tubs in a healthy state of growth which are ordered for the exhibit of the United States Department of Agriculture at the Tennessee Exposition. I have already sent one shipment and these are excellent samples of the varieties I recommend. They are my selection from over thirty varieties in the past twelve years, and I have discarded all others.

For all round shipping; I advise all growers to raise the Smooth Cayenne. My reason for this is because the fruit packs nicer, keeps longer, and is equal in size and quality to any pine grown. For home consumption the Abbaka is perhaps the best fruit, being sweeter and more juicy than the Smooth Cayenne. It is not such a pretty shaped fruit, however, nor can it be shipped as successfully to the northern markets. The Golden Queen is an excellent plant, equal in some respects to the Abbaka. My two most expensive plants are the Enville City and the variegated Smooth Cayenne. The latter is more an ornamental plant than a plant of commerce; the Enville City shows great possibilities that have not yet been fully developed.

In reading over the Horticultural Society's Report for 1896 I find several errors that I wish to correct. First the report describes the Smooth Cayenne as a good apple but not the best. It is without doubt superior to any pine in the list printed. Second, the report says that the fruiting season is summer. This is misleading. I can produce fruit at any season of the year, and my best money crop is the one I cut in winter. The Smooth Cayenne should be marked D. C. S. if any should, as it can be shipped to any foreign market and will keep from four to six weeks after being taken from the plant.

The Smooth Cayenne should also be marked as a vigorous grower, which it most certainly is.

The Abbaka is the strongest grower in the lot, and also the most prolific in plants and certain to fruit. The report fails to show this, but gives the credit to a vastly inferior variety. Yet, where is there a grower of any variety that can point out any pine that has produced ninety-eight plants at a single fruiting, as the Abbaka has done in my pinery? Over five hundred people visited my pinery to see this remarkable plant.

The commercial advantages of the pine do not rest wth the sale of the fruit. Each of these varieties which I recommend will give an average of from five to ten

new plants each season if properly treated, and the cost of treating a plant properly for a year does not exceed two cents.

Now suppose you plant an acre with, let us say, 8,500 plants. It is safe to say that within two years from the time of planting you will have 35,000 plants. If you wish to enlarge, you are then able to put out three acres more from your own stock, and the sale of the fruit and the remaining plants will have paid all expenses and netted you a handsome income. These are facts which I have demonstrated and cannot be disputed.

I recently received a letter from Pennsylvania from which I take the following extract to show you that the ways to dispose of the fruit are endless: "The value of the pineapple is not at present at all appreciated, and as it becomes known the demand and price will increase. If I could get a quantity of fruit at this time I could pay a good price for it, for I have a way of putting it up as a cough and cold and dyspepsia remedy, and also as the most delicious table syrup ever tasted, so that I could sell quantities, and would pay handsomely for a quantity of the fruit." The writer of this letter has organized a company, and work has now commenced on a building of a cover for a ten acre pinery for which I have a contract to supply the plants.

One of the best known patent medicine concerns in the world has invented a process of putting the juice up, preserving its natural flavor. This concern has already planted a large pinery from my stock, which is now in fruit, and expects next fall to advertise the medicinal properties of pineapple juice and market their medicine.

The United States contains 70,000,000 people, and I have no doubt that over half of them have never yet tasted the pineapple. These instances alone show that the market cannot be over stocked at any time, and are excellent reasons why the farmer and fruit grower should turn his thoughts to the culture of the pineapple.

There is a much mooted question about the amount of cold a pineapple can stand. I can say with twelve winters' experience, that the pine will stand as much cold as the orange tree. This has been proved beyond a doubt, and it is a settled question that the plants will recover from an unprecedented cold snap in a single season.

There are less culls in pineapples than in any other fruit I know, and there are no pests which cannot be destroyed easily, thus making the culture of this king of fruits a pleasure, free from worry, with a certain crop and comparatively no fluctuations in the market price. I have taken out of my pineries during the last season over 80,000 young plants and 26,000 pineapples, and in no instance have I had a word of complaint from my customers, showing that the plants are hardy and thrifty, and the fruit everything that could be desired.

There will be shipped from Orange county within the next eight months almost double the quantity of fancy fruit ever shipped in a like period, and the supply then will not half equal the demand from two of our larger cities.

A good many of my friends on the East Coast disagree with me about the advantage of a cover. To them let me say, that the amount saved by the cover in the prevention of the sun-burning of the fruit in one season alone, more than reimbursed me for my expenditure. In addition to this, pines grown under cover are larger and more juicy, the partial shade allowing the fruit to mature before ripening. The

cover also prevents, in a large measure, the moisture from being absorbed by the sun, and saves the expense of irrigation; it prevents the evaporation of the volatile elements in the fertilizer, and saves 30 per cent of the expense in that direction.

My fruit brought me a better figure last season than in any previous year, showing that the better the fancy varieties of this king of fruits are known, the better they are appreciated.

I have already written a history of the plant, giving information about material for cover and how to build, how to prepare land, how to plant and when, and how to care for a pinery when planted.

I have still a few copies of this article left, and shall be pleased to supply any person present, and answer any inquiry he may wish to make.

A member: I would like to ask the gentleman how he can control winter fruiting?

Mr. Russell: I set the plants at different seasons of the year; that will control it. Then I set different aged plants out in the same season of the year; you can control it that way.

A member: I have a small patch in which I set a year ago last November some of the Porto Rico; what time do you expect them to fruit?

Mr. Russel: The Porto Rico no man can tell about; it will take all the time any plant ought to have, finally it will fruit, and the next season it won't. The Smooth Cayenne if it had the proper treatment would have long since fruited. The Smooth Cayenne will fruit promptly on time if you give it prompt attention. Directions how to handle the plant you will find on the secretary's table in the rear of the room.

A member: The plants are expected to fruit in eighteen to twenty months, that would be from the first of November a year ago at the present time. I gleaned that from what I read on pineapple culture.

Mr. Russell: When a man buys plants from me I instruct him how to take care of them, and you come near getting fruit on time.

A member: I can show plants in my patch as large as I have seen here in Orlando, twenty inch plants when I bought them.

Mr. Russell: I can assure you there are parties here who can prove that they purchased plants off my place, and these plants alongside of others show mine are fruiting and the others are not. It is a good deal in the growing of the plant, and like the dieback on the orange trees, the pineapple will stand for months sometimes unless it has proper treatment.

GENERAL CITRUS DISCUSSION.

A Chapter of Experience From Various Localities on Cleft Grafting, Prevention of Splitting of Limbs, In-Arching, Winter Budding, Low Budding or Grafting, Budding on Tap Root, Summer Varieties, Tying up With Wire and Marlin.

[SEE MINUTES PAGES 1 TO 5, ITEM 96.]

(The following discussion took place on Friday morning after the regular program of the Society had been completed.)

Mr. Hart: I wish to speak of a few matterm connected with the Citrus. Cleft grafting in winter is a desirable way to propagate varieties on sour sprouts or sweet seedling stocks where the sprouts are large and come out near the ground. I have practiced it this last winter more extensively than ever before, and with most gratifying results. I have, since the freeze been trying to get the sprouts as near the ground as possible, and then work them low down. In cases where the sprouts are large, or there are a good many on the tree, it is difficult to get the bud to take and to start so slow, but cleft grafting answers this purpose in my practice, and I would recommend it for general practice in future to any one whose trees are in the condition mentioned.

About the limbs splitting down. Those whose trees came out above the bud, can look for nothing else but hollow trunks in the future. The sprouts that come haven't the strength, or the stump will not have the strength to hold the limbs when loaded with fruit without help; they will strain outward in the direction in which they are weakest. We have got to take measures for staying those up or they will sometime split down. We had a little gale for a few minutes in my part of the country a short time ago, and one of my trees, large enough to bear a couple of boxes of oranges, spread out like an umbrella turned wrong side out, and the branches lay on the ground in all directions. That was in a grove more exposed to the wind than any others of mine are. All the rest are so surrounded with wind-brakes that it is not possible for serious harm to be done them in this way. My method of obviating the splitting down of limbs is to take a large size, smooth fence wire, and where there are sprouts coming up from two sides of the tree. I bore through the center of each with a bit at a low enough point to allow them to bend well above, but high enough to support the sprouts and put this wire through and take a twist at each end. That binds the two together; the wire will grow into the tree and does no injury, and those sprouts are supported as strongly as if the trunk was sound. When there are several sprouts I run the wire through the center of each of them from one to the other and so bring the ends

together and twist in a close twist cutting the ends off so that the wood can grow over them. Why do I put that through the center? Some people think it will injure the tree. You remember the advice to drive nails in trees to prevent disease; they do no harm. I think they do no good, but at any rate there is no harm in boring a gimlet hole through the center; it does not injure it perceptibly, and it will strengthen the sprout when the callus forms. If you put it around the outside, the tree grows over it, in a way to weaken the limb where the greatest strain comes. If you have limbs that have smaller branches stiff enough to hold, you can run through the crotches and staple the wire there with small staples. I consider my trees that are wired as firm as if the trunks were sound. I also use stove bolts such as are used to put stoves together; the head is rather small. They are long, slim, and cheap and answer the purpose quite well. As the limbs grow larger and the strain is heavier it may be I will use more bolts and less wire. The old Elm on Boston Common, from which supposed witches were hung in the olden times, was preserved for a great many years by bolting the limbs together. Bolts and wire, used judiciously, do no harm; they soon disappear as the wood grows over them but they are still serving the purpose for which they were used.

Mr. Gaines: I think Mr. Hart's idea of boring with a wire is a good one where it can be done; at the same time I have used a method, but which did not originate with me, which we call in-arching. If there is a sprout on one side of your tree that needs a brace, and you have a sprout on the other side you can put your wire across all well and good. Where the sprout is on one side, take a small sprout on the other side and in-arch it, put it across the stump to a larger sprout; that makes a brace from the opposite side of the tree. As a matter of fact, I believe if a fellow had nerve enough, the best thing to do would be to cut every tree slap to the ground or to sound wood clear through. I admit I am going against my own judgment in not doing it. I have some trees with fruit on above the bud, but they are shells and I know I ought to have nerve enough to cut that tree; I know it is better to do it.

I just suggest in addition to Mr. Hart's suggestion about the wire across, I think it is good. At the same time, if you have a tree you can use in that case; I think this in-arching will answer the same purpose; at the same time if you have got nerve enough cut that tree down, to where it is sound all round.

Mr. Painter: I have been in a good many groves since the freeze. The treatment that has given the best results is where the trees were cut off to the level of the ground before the sap had a chance to sour. The result was, shoots put up and where left, made a fine growth the first year. I noticed in town a grove that seemed to have been done that way and the shoots tied together, and now all those shoots are the same as one trunk, and in time they will be joined to the ground. I have been in a grove where the trees were killed a good many years ago; I could not find out when they were killed, but you can see by the marks on the bark four sprouts were allowed to grow up and they were united as one. You could see the creases of the bark where they had united.

It would be my policy in case of another freeze as severe as that of '94 and '95 to

cut the tree off at the ground before they had time to become affected by sour sap.

Mr. Hart: I will say in reply to Judge Gaines that in-arching is an old and well known method, it has been generally adopted since the freeze; it is well to use wire in connection with in-arching. You can in-arch but a small limb, and it will take two or three years for it to get strong enough to become a sufficient support, therefore wiring, which furnishes that support at once, is very desirable.

About cutting to the ground, I believe Judge Gaines would make a great mistake to cut off the trees to the ground now. The time for that was directly after the freeze, and any tree not alive above the bud, so cut at that time, would have been in better shape now than if left to follow its own inclinations. The cutting off now would affect the trees like another freeze; it would seriously weaken them.

Has anyone been doing any winter budding in the middle of the winter when the sap is gone?

Mr. Gaines: I never did a great deal. I budded some this past winter and was fairly successful at it, but I admit I tried it more as an experiment and out of curiosity than otherwise. It was the system of winter budding as announced by the Experiment Station in Texas; cut a part of the wood and put it in, and I have been fairly successful.

Mr. Gould: I have done some winter grafting or budding. I will say that it has not been eminently successful in our section near Eustis, particularly so late in the season. The last budding or grafting was very discouraging; the early was quite successful. The later budding possibly from five to twenty-five per cent lived; the early 50 to 75 per cent. Just one word in regard to this in-arching, I think it is a mistake Mr. Hart labors under, in regard to the time it requires to make a sufficient strength of brace to sustain the bud of the old tree. I know cases of in-arching that were put in since the freeze that are larger than my arm now, and there is not the slightest danger of the bud falling off. If we can put in in-arching this spring and encircle the top of the buds with No. 16 wire to hold them in place, (when you put in the in-arching sprout put in wire to keep the top from spreading and to hold the in-arching in place, wrapping it as you would a bud,) you can be reasonably certain by next fall your in-arching will stand without support of wire or anything else; that is my experience.

A member: I would like to ask the gentleman if he has in-arched with water shoots?

Mr. Gould: I have in-arched fully matured hard wood as large as your thumb one-half to three-quarters of an inch, simply binding it to hold it in place until a little time elapses and it will then hold itself without any trouble.

Mr. Hart: I have used wire nails in in-arching and used them very successfullly. I think the use of these slim nails for this purpose is one of the nicest things I have struck in a long time; they hold the limb in place while you are wrapping it and strengthen its hold permanently, facilitating the work considerably. In cleft grafting the orange it is necessary to cut away one bud to make a wedge long enough. In January I inserted these surplus buds, as they were cut, on the plan of the Texas Experiment Station's winter budding, and think 75 per cent are living and doing well. With a little more experience I might

possibly save a larger per cent of these buds.

A member: At what time during the winter do you think it would be best?

Mr. Hart: Anytime you do cleft grafting, before the sap starts and before the new growth is one-half inch long. I think North, on the plum trees, they do it as late as when the trees are in bloom. I should prefer to do it in January.

F. D. Waite: In regard to budding, it has been my experience that during the flow of sap in the spring we had the best success. I will say this, that often, however, in budding in spring we found some trees that would not take. I have taken a knife and cut off the bark, cut quite a large piece, placed it over and wrapped it, and it will live every time; slip the bud in and cut the bark off and wrap it.

A member: I would inquire if the process just mentioned is what is known as the Texas winter budding?

Mr. Hart: Yes. The winter budding which was discovered by the Texas station was a re-discovery; it had been used in Russia. Instead of cutting the bark off, it is making the lower part of the cut go down into the wood; cut off the flap thus made, so it will come up just under the bud on the shell, slip the lower half of the shield under that, see that the top fits the cut fairly well, then tie.

A member: Is it material in the process that the cut goes into the wood and this flap be left?

Mr. Hart: I think it would make all the conditions of success for a winter bud. The flap will hold your bud in place until you can wrap it, and it seems necessary that the cut should go into the wood.

Mr. W. A. Cooper: I really know less now than I ever did about oranges. I am here to listen and trying to learn. I have my works out there to show, and I am in hopes to carry some out to show them. It is cut and try, however. With my smaller trees when the freeze came, I had them cut as close to the ground as the men could cut them; after the sprouts came up we budded them, some not larger than a lead pencil; now I have all my buds cut off the entire place, and they are coming on nicely; some buds two years old I counted 15 to 20 oranges on them. On the old place there were about 3,000 trees about 30 years old; those trees are two-thirds as large as they were before the freeze. We have no occasion to wire them or use stove bolts, or anything of the kind; they are there to show for themselves. The grove has a good crop on and seems to be holding well. We have worked them and fertilized them and that is as far as I can tell you. Really I am at sea as to what is best to do. I am groping about in the dark and hoped to get some information from the others here.

Mr. Gaines: I would like to ask a question. I would like to ask if any of the members know anything about the Joppa orange? From what I have seen advertised about it I think it is desirable. I would like to know if any one has had experience with it. The Joppa Late it is called. If it is what it professes to be I think it is desirable.

Mr. Bacon: Mr. Reasoner says it is a California late orange. He says he has not seen the fruit and don't know its qualities.

Question. I would like to ask if it originated in Calfornia?

Answer. It is a California seedling.

Mr. Wright: I would like to know if any one has had experience with the Lamb's Summer, a very late orange; hold-

ing as late as July and some as late as August.

A member: I have never fruited the tree. I bought some years ago and placed the buds in some large trees, expecting them to fruit in a year or two, and some one said it was a very fine bitter sweet so I cut them out.

Mr. Painter: I was probably the first one who saw the Lamb's Summer orange. Mr. Lamb was a grower in Volusia county, and he attempted at one time to raise a nursery. As you all know 15 years ago that was quite a business—but like a good many other men he let the nursery run down. There were a few trees left at the end of the row, which grew up almost wild, no attention being paid to them at all. He said he had eaten the fruit of the tree and it was so sour he considered it worthless and never paid any attention to it. One day in July he brought to my office a sack containing probably a dozen, and I tasted them, and passed them around. Everyone who tasted them pronounced them delicious summer oranges. I mentioned the orange at the time in the Agriculturist and gave it the name of Lamb's Summer. I had some of the trees growing on my place up to the time of the freeze, but unfortunately none of them survived.

Mr. Wright: My attention was called to it the summer after the freeze of '95. I saw some of the oranges in DeSoto county. I saw them in July, and thought so highly of them I secured some of the buds and have been propagating the trees since. I have hesitated about recommending it further than what I saw in DeSoto county in '95.

Mr. Gaines: I will ask Mr. Wright if he knows anything about the orange called Somer's Summer; if they originated it in Orlando or propagated it?

Mr. Wright: I don't know anything about it.

Mr. Gaines: One day I was in the establishment where Mr. Wright is located, and I met a gentleman who brought in a few fruit of Somer's Summer, and I had the pleasure of sampling a couple of them. They were smaller than I ever saw a wild summer orange grow. It was late in the summer, along in July, and for a fruit when a man is thirsty they are quite tasty, but they are not fit as a market orange. It may be a desirable variety to have in your door yard. In regard to the Lamb's Summer, I was searching for the trees two or three years before the freeze, but was advised to let it alone as it was a shy bearer.

Mr. Painter: As far as the Lamb's Summer being a shy bearer, the original tree was anything but a shy bearer, I never saw a tree have more fruit than that tree.

Mr. Taber: Will Mr. Sampson give us his experience?

Mr. Sampson: I will report next year. I can say we have budded six or eight buds to the stump and we are using the water sprouts as they come up. I shall use the wire around the top to steady them.

Mr. Margary: I would like to ask the question in regard to the proper height at which to put the buds. I find on the place I have charge of, a great many buds that are perfectly sound for three or four feet where the buds are put low; where put in above three feet from the surface almost every one was killed.

Mr. Wrght: I have had so much call for trees budded very low I am advising putting in under-ground grafts; cut the seedling under-ground so that the bud is really under-ground. The object is to meet

that great demand—that is, the call for trees that are low budded, and instead of budding, the grafts are clear under-ground.

Mr. Gaines: On the question of budding, I believe in budding as low as possible. It is true, my observation is, that on some soils the orange tree is liable, on a sweet stock to foot-rot. Some soils are not subject to that. Outside of those peculiar soils that subject the trees to foot-rot, I believe in a very low bud, as low as you can. On such land I believe you want to bud high. My grove is high land, but with that difference, and where you are subject to foot-rot, I think you should bud high, some 12 or 15 inches; otherwise bud very low.

A member: Have any had experience since the freeze of putting the bud in the tap root instead of the crown. It may possibly be of interest to some present to relate my experience. On the advice of an old orange grower, instead of cutting the trees off at the time of putting grafts at the surface, I dug down and inserted the graft into the tap root from six to ten inches below the surface, not disturbing the ground so the shoots could come up and be afterwards budded. I was unfortunate in not getting my grafts early; I was not able to commence until June. I have trees from those grafts three inches in diameter and full of fruit. They are imbedded from six to ten inches below the surface.

Mr. Bacon: One point has been broached here, the tying up of buds. I advocated the idea, and carried into practice the tying up of buds with wire. I tied up my buds last fall, and having several thousand feet of pitch lumber I split it into stakes and tied my buds to them, the whole bundle first, anywhere from one to ten buds, putting the wire around and taking a little turn, and I have gone to bed this winter and slept well, and I haven't lost a bud. I was talking with Mr. Knox over the telephone, and he asked me what the people of Florida were doing in that direction, or what they were doing to save their buds from the wind; he had gone to headquarters—which was a bright idea—he had written to Mr. Hubbard in Jacksonville, asking him what the people in Florida were doing in the great majority of cases in tying up their buds. Mr. Knox had used marlin. I expect from his experience he knew we could not trust it; after a heavy wind you will find $10 buds laying on the ground. Mr. Hubbard's reply was, I think, in nearly these words; "You can have no idea of the amount of galvanized wire the people of Florida are using. We cannot keep up with our orders. We are selling tons of it."

A member: Marlin will not stand the wear and tear that wire will, it is true. I have used it for buds for the last two seasons, and it will last this season through. I have driven stakes in, and I take one turn around the bud and take another turn around the stake and tie in a hard knot, and I am sure I will lose no buds in a November gale. I use the best tarred marlin I can procure.

Mr. Bacon: I have tried that with wire and marlin before, and if I took an extra turn around the bud the bark will grow around and the tree be almost girdled.

A member: My experience supports the gentleman's statement. I cut my trees as close to the ground as I could get and budded the first shoots; after getting out two or three feet high I clipped off the leaves and grasped them together, five or six, and I took a thick rag and wrapped it around two or three places—several of

them—and put two or three pieces of wire and one piece of rag about two inches wide, and I fastened that securely on.

F. D. Waite: I have a six-acre grove at Eastlake, on high pine land, sodded with Bermuda grass; nothing was done to the grove until November, 1895. From four to six sprouts had grown from eight to fifteen feet high. I cut the sprouts off six feet high, cut the trees off within eight inches of the ground, dragged them out of the grove intact and burned them, returning the ashes to the grove.

The sprouts were budded April 13th, 1896, and today stand from six to eight feet high with a spread of from four to six feet; some have bloomed and set fruit. Adjoining groves were cut off immediately after the freeze and the stump and roots threw up from 10 to 20 sprouts but they were not as large as mine, and though they were cultivated, and fertilized the buds are no larger.

My grove was fertilized just before the freeze, has had no cultivation whatever, and only one application of one ton of nitrate of soda, which was applied April 20th, 1897.

In our 40 acre hammock grove at Belleview, the trees were cut off at the ground in March 1895. Nearly every tree started sprouts but have been dying ever since; at the present time there are fully 25 per cent. of the trees dead.

Another ten acre grove adjoining, on the same class of land, had nothing done to it till about April, 1896, when the owner (Mr. G. E. Snow, of Eastlake) examined the trees and found them nearly all alive at the ground. The earth was removed from the collar roots; during the summer they sent up from four to six good sprouts; in November the tops of the trees were removed and these sprouts were dormant budded. Fully 90 per cent of the trees are alive and the buds growing nicely.

My experience thus far has been that the old dead tops were a partial shade, and while we did not get as many sprouts, we got better ones by leaving them standing until the sprouts were large enough to bud.

In the rich marl hammocks with the dead tops removed and a dry season following I believe fully one-third of the roots will die.

Mr. Painter: A few days ago I received a letter from a gentleman in Massachusetts, wanting to know the process we followed in making navel oranges. He had heard we took the seeds out with some kind of instrument and the crease on the orange was the result.

NOTES ON ORANGE DISEASES.

Foot-Rot—Sooty Mold Following the White Fly—Frenching and Variegation—Fungus Rots in Decaying Orange Trunks—Limb-Rot of Orange Mat-Root—Purple or Hairy Mite.

Paper prepared and read by Herbert J. Webber, special agent U. S. Department of Agriculture, Sub-Tropical Laboratory, Eustis, Fla.—With discussion following.

[SEE MINUTES PAGES 1 TO 5, ITEMS 32 AND 34.]

I am sorry that it is necessary for me to make this report, but on account of the ill health of Mr. Hubbard necessitating that he should take a trip to the West, it falls on me to make such a report as I can. I received a personal letter from Prof. Hubbard which contained some valuable notes on observations he has made in California, New Mexico and Mexico, and as the letter contains much of interest to the Society, I will read it.

(Mr. Hubbard's letter will be found under a separate heading immediately following this paper.—Sec'y.)

FOOT-ROT.

It is a common observation that an epidemic of foot-rot is liable to follow severe freezes. Judging from recent observations made in various parts of the State it would seem that the 1894-95 freeze is to be no exception. In many groves I have noticed symptoms of foot-rot to be very abundant. The disease has appeared in many places where it was before unknown. The condition of the trees following severe injury by frost seems to be such as to induce the spread of the disease. Unfortunately, the crown grafts which were put in extensively after the freeze in various parts of the State, very commonly show gumming above the point of insertion and a sloughing off of the bark similar to that which occurs in foot-rot. Many cases have also been observed in rapidly growing buds where gum issued above the point of insertion, causing a decaying of the wood and ultimately entirely girdling and killing the sprout. A gum disease entirely different from foot-rot is of course not uncommon under conditions of very rapid growth, and it may be that this gumming of crown grafts and buds is not to be associated with foot-rot although the sloughing of the bark observed in some such cases is exactly the same as occurs in this disease. The gumming of grafts has been so serious in several places as to cause considerable alarm, and a number of inquiries have been received at the laboratory in regard to the disease and its treatment. Whether this exudation of gum in crown grafts is to be attributed to foot-rot cannot be positively affirmed, but from its similarity to this disease it is probable that the treatment used

for foot-rot would prove beneficial in this case also. On two crown grafts in our experimental grounds last summer gum was exuded around the collar just below the ground; and the grafts, at this time one inch in diameter, were nearly girdled. As soon as this was observed, the soil was removed from around the collar and crown roots, as is done in treating foot-rot; the dead wood was then cut away and the scars were painted with a solution of carbolic acid, (crude carbolic acid one part, water five parts). The trees seem to have thoroughly recovered, but it cannot be surely affirmed that their recovery was due to the treatment given.

During the past year experiments have been started in treating foot-rot by in-arching young sour orange trees planted around the bases of diseased trees. The sour orange, as is well known, is almost wholly immune to the disease, and if it is found practical to in-arch young sour trees in this way, it is probable that sweet seedling trees badly diseased may be saved. While it would seem that this method of treating foot-rot would be one of the first to suggest itself, knowing the immunity of the sour orange stock, yet I have not learned that it has been used. There is of course some difficulty in getting young trees to live when planted out under old trees in this manner. However, if they can be watered occasionally until they are well rooted, it would seem that this difficulty would not be a serious one. The method is at least promising and should be thoroughly tested.

SOOTY MOLD FOLLOWING THE MEALY WING OR WHITE FLY.

Several important discoveries have been made during the year on the treatment of sooty mold following the mealy wing or white fly (Aleyrodes citri). At the last year's meeting of the Society I described a fungus parasite of the mealy wing (Aschersonia aleyrodis) which had been found in numerous groves of the State and was apparently doing considerable good in killing out this enemy of the orange. At the same time I mentioned briefly the discovery of a second parasitic fungus found at Manatee, Fla., which bids fair to be even more effective than the Aschersonia. During the past year careful observations have been made on the action and spread of this second fungus, now known as the brown mealy wing fungus, and it would seem that it is liable to prove a great benefactor to the orange grower. This friendly fungus will be further described in my paper on "The New Art of Warfare against Scale Insects," published in another part of this Report.

A second point of interest which has been learned during the work of the last year is that in treating the mealy wing by spraying, several applications (probably two or three) should be made during the winter and one during May. From the results obtained in treating this pest by growers in the Manatee region, it would seem that one spraying in the May season is very important. In one grove at Palmetto, Fla., which had been sprayed three times during the winter season with resin compound, a portion was sprayed once during May with the same mixture. In walking through the grove the portion sprayed during May could be very easily distinguished by the less abundance of the sooty mold.

FRENCHING AND VARIEGATION.

From the abundance of variegated and frenched twigs sent into the laboratory during the past year it would seem that

this malady, whatever it may be, has become very abundant. Genuine variegation, which, while probably a disease, has never become sufficiently abundant in any case to cause serious damage, only an occasional tree here and there being so affected. Frenching, however, which I believe most growers clearly distinguish from variegation, is frequently very abundant. It is probable that frenching is merely a symptom indicating improper conditions. It is very frequently a symptom of blight, exanthema, and foot-rot, and probably indicates a general debility of the tree. It unquestionably frequently results from improper drainage and improper fertilization. So far as the disease —if such it may be called—has been investigated, it is difficult in individual cases to determine the definite cause. Wherever it appears it would seem to indicate that the conditions are not altogether satisfactory.

FUNGUS ROTS IN DECAYING ORANGE TRUNKS.

Since the freeze much alarm has been caused by the appearance of different fungi on old decaying orange trunks, it being thought that they were the cause of the dying back. It is probable that these fungi in most cases are simply secondary, growing on the decaying wood caused primarily by the freeze. "Jew's ears" (Herneola sp.), a brown rubber-like fungus, has been very abundant and has caused considerable alarm. So far as known, however, it grows only on decaying wood, never primarily causing disease. Various species of bracket fungi (Hydnum, Polyporus, etc.,) have also been very abundant, but undoubtedly of themselves do not cause disease.

Several other fungi have been very abundant, growing in the wood of the decaying orange trunks, and it is possible that in some instances they have extended the dead line to some extent. I think, however, that they grow mostly on the wood injured by the freeze.

There has been considerable complaint among owners of old seedling groves in regard to sprouts, which have grown to a considerable height, breaking off and in some cases dying back. Some have prevented this by in-arching into the main upper branches the sprouts which spring up around and base of the tree. These being in-arched into the upper sprouts several inches out from the old trunk form braces which greatly strengthen the top sprouts. This, it seems to me, is an excellent policy to pursue in such cases.

LIMB-ROT OF ORANGE.

Several cases have come under my observation during the year of rapidly growing twigs being attacked and rotted by a parasitic fungus (Gleosporium intermedium). The limbs thus affected show numerous spots which appear somewhat water-soaked on which small eruptions of the tissue occur. These eruptions are formed by the spores which develop below the epidermis and as they ripen burst out. Unquestionably this disease can occur only on sprouts which have grown very rapidly and are thus soft and tender. If the fungus is found to be spreading rapidly it could probably be checked by pruning out the diseased limbs and by checking the growth of the tree. It is probable also that spraying with Bordeaux mixture or some similar fungicide would prevent the spread of the malady. The disease has never been sufficiently abundant, so far as has been observed to occasion alarm, or to necessitate extensive treatment.

MAT-ROOT.

In several places in Florida my attention

has been called to a condition of the orange known as "mat-root" which may or may not be a disease. I mention it here simply as a point of interest and that you may be familiar with the disease should it occur. In this disease, if such it be, the roots develop in excessive abundance near the surface and form more or less dense mats which become exposed by plowing and erosion. This has led to the application of the term "mat-root." From the base of trees so affected sprouts spring up which instead of exhibiting the normal foliage of the sour orange tree, usually have small leaves with unwinged petioles which are greatly crowded on the stem. They somewhat resemble the foliage of the myrtifolia orange. It is doubtful whether mat-root can be considered a genuine disease. The same symptoms may possibly be produced by sporting or reversion.

PURPLE OR HAIRY MITE.

The purple or hairy mite (Penthalodes mytilaspidis) until a few years ago was unknown as an orange enemy. Recently, however, it has become so abundant and widespread that it is causing considerable alarm. The mite is of a deep purple color and hairy. It is somewhat larger than the six-spotted mite (the common red spider) and feeds upon both surfaces of the leaves, running all over the leaf instead of limiting itself to certain spots on the under surface as in the case of the six-spotted mite. After the insects have fed on a tree for a time and become very abundant, the leaves seem to become distasteful to them and they apparently migrate to other trees. I judge this to be the case from the fact that one may frequently find trees which have been badly injured on which none of the insects occur although many may be found on adjoining trees. The effect of the purple mite on the tree is very serious. The leaves assume a grayish ashen hue and are easily distinguished from those on uninfected trees. In severe cases total defoliation of the tree may occur. Judging from treatments which have been made by various growers it would seem that the sulphur solution in the strength commonly used for the red spider or six-spotted mite, is effective also in treating this pest. The spray, however, must be so applied as to reach both surfaces of the leaves. Where growers are supplied with irrigation plants it is probable that the numbers of the pest can be kept within bounds by spraying the trees thoroughly with water, the force of the water serving to kill many of the insects and to wash off others. The resin compound (formula given on p. 72 of the Report for 1896) diluted in the proportion of one part to seven parts water is also apparently effective in treating this pest, as are also the resin wash and kerosene emulsion. The two latter, however, are more costly than the resin compound and are apparently no more effective.

Mr. Bacon: What discoveries have been made in regard to the borer and blight?

Prof. Webber: Mr. Hubbard has been studying the various borers quite carefully since the freeze, but what his results are I do not know. He has published something in regard to them I believe. Unfortunately, I have nothing important to report on blight. You may, however, be interested in the results obtained by Mr. Franklin, a member of this Society, in controlling this disease by extirpation, as we have recommended in previous reports. He informed me a few weeks ago in Washington that he had followed the practice of digging up the trees just as soon as

he observed that they had the disease. He kept a careful record of the number of new cases appearing, and reports that the number of new cases appearing annually are much less than in previous years. This is exactly what we expected would occur.

I might say in regard to "blight," that it is one of those diseases like peach yellows; it may be studied for a century and nothing found more than we know at the present time. In the investigation of peach yellows it has been found that digging out the diseased trees is the only successful treatment. Laws have been enacted in many States declaring the diseased trees to be a public nuisance and requiring their destruction.

A member: Where were the leaves obtained that you have exhibited?

Prof. Webber: They were obtained in Orlando.

Mr. Francis: Is the white fly in Orlando?

Prof. Webber: It was in Orlando before the freeze but I am not informed whether it has appeared since the freeze.

A member: Will the speaker give us a method for treating the mat-root?

Prof. Webber: We have no treatment for it; we do not know indeed whether it is to be considered a disease in the true sense of the word. We want to know what it is and if you have any light as to its nature, kindly give us your experience.

Mr. Francis: Is it similar to what you saw on the trees at Citra?

Prof. Webber: No, that was a trifoliate leaved sprout; entirely different. It is similar in that it comes from the roots of sour orange trees, but trifoliate-leaved sprouts only occasionally occur, while "mat-root" is quite abundant. I have seen 25 trees thus affected within the last six months.

(Further discussion following Prof. Webber's paper will be found under the head of "Blight and Scale" in this report.)

OBSERVATIONS IN CALIFORNIA, MEXICO AND NEW MEXICO.

Letter from Prof. H. G. Hubbard, of Crescent City, Fla., special agent U. S. Department of Agriculture.

[SEE MINUTES PAGES 1 TO 5, ITEM 33.]

YUMA, ARIZ., April 7, 1897.

Dear Prof. Webber:

I am reminded by Mr. Taber that I am on a Committee on Diseases and Insects of Citrus to report to the Florida State Horticultural Society. I am afraid I shall have to omit any report this year, although there are many things that I should like to bring to the attention of the Society if I felt able to do so.

I have paid a short visit to the coast region of southern California and although the wet weather drove me back to the desert, I saw a few orange and lemon groves at San Diego and learned much that was novel and interesting to me. As regards

citrus insects in that part of the world, the thing of chief interest seems to be the absolute failure of all importations of Australian enemies of scale insects other than the Vedalia which attacks only the cottony cushion scale. It appears that the growers have mistaken for one of the exotic scale-eating lady birds which was introduced into California by Koebele, a very closely related native species which, unfortunately, does not feed upon any scale insect, but eats only plant lice. The imported beetle is a species of Rhizobius. It lived for a time in some of the groves where it was first introduced and fed upon scale insects on the orange, lemon, etc., but it seems to have now disappeared. It is evident that few, if any, of the Australian enemies of scale insects can be naturalized on this continent, always excepting the Vedalia which was of course a grand success, but useless as excepting against the Icerya. I was greatly pleased, however, to find that one of our old Florida friends, the twice stabbed lady bird (Chilocorus bivulnerus), is doing the same good work there that it does with us, and it is becoming extremely abundant and active in citrus orchards. Moreover, there is another species of the same genus (Chilocorus cacti) which so closely resembles its relative the twice-stabbed lady bird, as to be distinguished with difficulty, and this insect also is taking to eating the hard backed scales on orange trees, and is particularly useful in clearing them and the olive trees of the black scale. In fact this lady bird is going to be the savior of the olive groves as the Vedalia was of the orange and other citrus plants. The cactus lady bird (Chilocorus cacti) is also a widely distributed native species which, however, was formerly supposed to confine its attentions to the soft white mealy bugs living on cactus plants. Fortunately, it is learning that there are other good things to eat and it is becoming very abundant in the olive and orange groves of San Diego. In fact I think it is efficient in controlling the black scale (Lecanium oleae) which the Californians frequently attribute to the non-existent Rhizobus, and I have no doubt at all that it will permanently hold this fearful pest in check. If we ever have need of its services in Florida, we, fortunately, have no further to go for it than to Key West, where it is abundant, feeding upon the mealy bugs on the prickly pear (Opuntia).

If you think it worth while to detail these facts and optimistic opinions of mine at the next meeting of the Horticultural Society, I shall be glad to have you do so. Here at Yuma and elsewhere in the hotter parts of the Colorado desert there are orange trees, and good ones, producing fruit of a quality superior to that of the coast region. The trees in these desert groves are absolutely free from scales or even rust mites, and they are in very truth the only perfectly clean citrus trees I have ever seen. The growers here attribute this immunity to the extreme heat of summer, and they fancy they will always have the same immunity from insect pests, but this is probably fallacious. It is true doubtless, as they assert, that pest ridden nursery plants brought into these hot regions in a short time become clean and free from insects, and the reason is no doubt, as they suppose, that the extreme heat is too much for them. But experience in Egypt and in the very similar hot and arid regions of Australia, shows very conclusively that this immunity is only temporary and that in time some of the familiar plagues will become

acclimated and then woe to the cultivator who has not his spray pump at hand.

Incidentally I might mention that we Floridians have at last a rival and a foeman worthy of our steel in the Mexican horticulturist of the rich fruit lands of Sonora. Here oranges can be grown that will perhaps put our unrivalled Florida productions on their mettle. At present the orange grown there is a sweet but insipid variety evidently of local origin and not sufficiently differentiated by cultivation from the wild or bitter sweet orange, of which it still retains a perceptible tang and flavor. When the highlands of Mexico shall have dropped like a ripe fruit into Uncle Sam's lap and the hustling Californian has replaced the easy-going Mexican in the land of Manana and pocto tempe, then will begin a contest in citrus culture that will be worth living to witness, and then we shall have to guard our shores from the advent of several new pests which infest the orange in that region, and notably from the orange fly maggot which, like the worm in a chestnut, eats the heart out of the ripe fruit, leaving all fair and unblemished without, but all rottenness within. This and other vile pests of that country we are trying to study now, so that when the evil day arrives we may be "forewarned and forearmed." Very sincerely yours,

Henry G. Hubbard.

BLIGHT AND RED SCALE.

Discussion following the reading of Prof. Webber's paper "Notes on Orange Diseases."

[SEE MINUTES PAGES 1 TO 5, ITEM 35.]

Mr. Westlake: I have seen sometimes a sign in a store, "If you don't see what you want, ask for it." I suppose we might have something of the sort here.

One thing I would like to inquire about is the scale known as the red scale of Florida. Some five years ago it appeared in my grove on a single tree, and it went on spreading until it pretty nearly covered my own grove and spread into other groves adjacent. It is a very destructive pest and resembles the San Jose scale, and I believe it is about as bad. I am told it existed before the freeze in some of the groves near Orlando, and I think it came from here, carried by orange pickers after the freeze the question came up, "what the effect of the freeze would be on the scale?" I remember some communications in the papers—one by Prof. Webber, I think,—saying that by defoliating certain plants the scale might be destroyed, an opportunity that may never occur again. I have not seen any indication of the return of the scale in my grove, nor in any of the groves in my vicinity since the freeze, and I hope it has been exterminated. If it still exists in any part of the State, perhaps

some gentleman will inform me. It is impossible to exterminate that scale with any known insecticide.

Another point is in regard to the blight. I am glad it has been referred to. I have had some experience with it. It appeared in my grove several years ago in a single tree and it went on spreading until it affected eight or ten trees in my old grove, from which I argued that it must be contagious. Since the freeze, I find that sprouts coming from the diseased roots are also affected and it is evident that the only remedy is to dig them up. Now what I want to know is, whether, if I plant new trees in the same place they will also be affected by the blight? As I wish to fill out my grove I should like to have some answer on it now.

Mr. Sartorius: In my part of the country they have no scale now. We have it practically under control but not altogether. A gentleman was telling me the other day he used Bean's insecticides and they were off his trees. I have been using ball potash and sulphur insecticide and have cleaned them off pretty well.

Mr. W. A. Cooper: You spoke awhile ago in regard to blight. Prof. Webber was telling us about this disease. After I heard his remarks about that, I had my foreman dig them all up; we spent a day to a tree, digging out the little roots and burning every thing clean, and I hauled the sand out for a space of 15 feet, and dug down four feet and hauled it in the woods. We let the hole stay open for a year and put fresh sand in, and planted other trees, and they are coming on nicely; I don't see any signs of blight at all.

Also in regard to foot-rot, I have never failed to cure a tree by the use of hot water around the tree; take a dipper and put on plenty of it. I never had a tree fail yet.

Prof. Swingle: As to the blight affecting a tree planted the second time in the same spot, I have seen such trees in full bearing and I do not think they are any more liable to blight, than those on virgin soil, provided the whole diseased tree has been removed. There is no particular danger in planting a new tree in the place of the old one in the light of present experience.

Mr. Hart: The blight is not apt to show on young trees. Would you recommend planting immediately after the old tree has been removed?

Prof. Swingle: I would not recommend replanting immediately, but I do not think it is necessary to wait a year.

Prof. Webber: I have just been told by Mr. Allen, manager of the Dommerich Grove, at Maitland, that they have been following the policy of digging out blighted trees and burning them in the holes from which they are dug, other trees are planted in these places about a year after. He tells me that they have trees eight years old in the places where the old trees were dug out and that they are apparently as healthy trees as any others in the grove.

I have personally seen trees, numerous ones, in various parts of Florida, planted in the places of old blighted trees and have only seen one case of blight under these conditions. I am convinced that a tree planted in the place of an old blighted tree is no more liable to blight than other trees.

In regard to the red scale we know that it was all over the State before the freeze, and I am inclined to think that it is at the present time also. I know that it is abundant in the sections of Manatee and Braidentown, where it is found in a number of groves. I have no doubt but that it will

be found here in Orlando also. It occurs on a number of plants, other than the orange, which were not defoliated by the freeze. It was abundant in many sections of the State before the freeze. The resin wash is said to be effective in treating the red scale if applied thoroughly and used correctly. I will furnish the formula for this wash to any one who may desire it. Don't consider it necessary, however, to apply the wash hot. I know of one grove almost defoliated by applying the spray while hot. If cold it is not at all injurious in the proportions commonly used.

NOMENCLATURE REPORT.

Annual Report of the Nomenclature Committee read before the Florida State Horticultural Society by E. S. Hubbard, chairman.

[SEE MINUTES PAGES 1 TO 5, ITEM 16.]

Mr. President and Members of the Florida State Horticultural Society: The Nomenclature Committee believes the time has arrived for this Society to align itself with modern botanical and horticultural progress and we will preface the deductions drawn regarding the systematical classification of citrus fruits by quoting from the preface and press comments on Britton and Brown's "Illustrated Flora of the Northern United States," which is founded on Engler and Prantl's "Natural Plant Families." "A work which represents more nearly than any other single work the matured convictions of systematists respecting the course of the vegetable creation," and this preface declares that "the nineteenth century closes with the almost unanimous scientific judgment that the order of nature is an order of evolution and development."

Mr. President, eminent citri-culturists, among whom I may mention Rev. Lyman Phelps and Mr. E. H. Hart, before the freeze of 1895 had probably fruited and studied larger collections of citrus fruits for longer periods than any other orange growers in this State, and the theories we hold regarding the evolution of the edible citrus are well known, having been discussed both in the horticultural press of this State and before this Society, but before we consider the specific classification of citrus fruits that this committee deems needs attention, we will present some of the views now held regarding the arbitrary systems of plant classification.

It has been customary in the past to follow the De Candollean order beginning with the buttercups and compositae and ending with the club mosses, but in the modern works I have named, the systems begin with the ferns and wind up with the compositae in their evident evolutionary order, and therefore "the division into families or genera," or "the grouping of species" are "necessarily more or less arbitrary and depend on the judgment of scientific experts." The arbitary rules defining

species have been criticised as follows: "The remarks as to the flexibility of groups are evidently not intended to apply to species for the attitude towards species seems to imply that the authors hold that assemblage to real entity in nature. Now, as a matter of fact, the species itself is just as much a grouping of forms, and is just as much a matter of expert judgment, as the genus is, and while they would hold the genus to be a mere arbitrary class, made for the convenience of description, they would adopt a wholly different attitude towards the species group, and they define it as "composed of all the individuals of a kind capable of continuous, successive propagation among themselves" a phrase that will apply to varieties, or genera, or families, just as well as to that other expedient, the species. The fact is, that whatever the definition of a species may be, in practice it is merely an arbitrary assemblage of forms which can be easily described and recognized."

There is undoubtedly more confusion in the classification of botany than in any of the sciences, and we have carried this question to some length, for, according to this definition of a species, the citrus family would be a species headed by the citron (Citrus Medica), which is descended from the wild, unedible, but sweet odored, fingered citron, and of which species oranges, lemons, citrons, pomelos, etc., would be varieties and the named individuals subvarieties.

This would certainly be a simple arrangement and justifiable by the historical and morphological evidence of the primary members of the family, but the citrus hybrids and crosses have in a marked degree the property of breeding true to type after a few generations of selective propagation, and although we may sympathize with the ambition of botanists to gain reputation by discovering and naming new species of plants, yet this practice, in the citrus especially, in the early days of systematic botany, produced a confusion which even Gallesio, owing to his having experience in the main only with the citron lime hybrids, was not able to wholly clear up.

He considered the citrus divided into four species, the citron, the lemon, the sweet orange, and the sour orange, but as he did not have, and was not able to propagate the pomelos and Citrus Nobilis families he did not include them with, nor recognize their influence on his European species.

He discovered historically that the citron was known several centuries before Christ, that the Arabs acquired the sour or Bigarade orange in the ninth century, that lemons appeared in the twelfth century, and sweet oranges about the middle of the fifteenth century, or before Vasco De Gama rounded the Cape of Good Hope and opened the way to India. The observations of Bonavia and others show the wild or fingered citron and the wild lime to be unedible fruits, and morphological evidence shows the citron of commerce and its related limes and lemons and the Bigarade or sour orange to be hybrids of these wild species. There is sufficient historical data to show the dates and rapidity of the spread of the citron and sour orange from Persia and Arabia to Europe, but there are no records of the migration of the lemon and sweet orange.

It is much more reasonable, therefore, to conclude that they are progressive hybrids of the citron and sour orange, formed in Europe, than that they were imported overland from the Indies, for the lemons

and limes of Europe differed materially from fruits of the same class found in these countries, and the China or Sweet Seville orange differed materially from the acid Portugal oranges with which they were compared when first introduced into Europe. Bonavia says, "Therefore, taking the want of an indigenous name in India for this type of orange (Portugal) and its varieties, it would appear that when the Arabs carried the Seville (Bigarade) from western India further west and finally into Spain, this sweet variety, (the China) had not yet reached western India, or at all events those parts of India then known to the Arabs." And De Condolle says, "It, therefore, appears to me probable, that the oranges imported later from China by the Portuguese were only of better quality than those already known in Europe, and that the common expression 'Portugal' and 'Lisbon' oranges were due to this circumstance."

Gallesio himself confesses, "I do not know, indeed, of any writer or agriculturist who has spoken of the sweet orange as the mother species capable of perpetuating and reproducing itself from seed." "Ferraris, writing in 1646, was aware that sweet oranges came true to seed in China and the Phillipines but counselled grafting to correct this defect in the orange trees of Europe. In fact, it took several centuries of grafting the sweet orange hybrids to fix the type sufficiently for them to come true to seed, and it was not till the frost of 1709 destroyed all the orange trees at Finale on the Riveria in Liguria, a short distance west of Genoa, that some of the neglected stocks were found to produce sweet oranges. I can say from my own experience that the seed of good bitter sweets produce sour oranges. In 1718 the grandfather of Gallesio planted a great number of orange trees at Finale which fortunately escaped the freezes during the century, even the "murderous freeze" of 1763, until 1782, when they were frozen to the stumps. Gallesio says further, 'Cut close to the earth they grow in the spring vigorously, and the sprouts known to be free were raised without being grafted. Unfortunately, a large number perished by the frost of 1799, yet several stalks escaped and each of them yielded in 1806 as many as 3,000 oranges."

Gallesio lists eight varieties of oranges: First, the type, or Portugal orange. Second, the China orange. Third, the red fruited orange. Fourth, the dwarf sweet fruited orange. Fifth, the olive-shaped orange. Sixth, the double-flowered orange. Seventh, the sweet orange with edible skin. Eighth, the Pompelmous.

The last four varieties named are discarded as being essential varieties of oranges. The fifth, or olive-shaped orange is evidently a variety of Kumquat, and similar ones are described as growing in Malaysia. The sixth is a sort of navel and should be classed with the Sweet Sevilles. The seventh is a citroned orange with thick skin, or an orange citron, and the eighth, citrus decumana, or pomelo, will receive attention further on. The Portugal or St. Michael oranges, the China or Sweet Seville, and the Malta Blood oranges are too well known as distinctive varieties to need further comment. We will therefore consider the fourth variety named by Gallesio and recommended by your committee to be placed in the alphabetical list—the dwarf sweet fruited orange of China, of which Gallesio had no personal knowledge

and which is presumably the China mandarin.

As the Catalogue Committee was directed by the resolution that formed it to follow the lines of the American Pomological Society's classification, the mandarin varieties form a special section in the catalogue submitted to this Society, and this section has received our special attention.

It appears that Rumphius was the first European to give thorough descriptions and drawings of the citrus fruits of the Malay Archipelago, his work having been published in 1750, and that the oranges he described as Aurantium Sinense were not the Citrus Aurantium Sinense of Gallesio and other Europeans but on the contrary were the mandarin class of oranges of which Citrus Nobilis the Keonla oranges of India (our King) and China mandarins are varieties and the sweet early-ripening Suntara oranges of India, something like Tangerines, the type of the Mandarin proper Gallesio quotes Perravis as saying it was not cultivated in the Phillipines, and that the Chinese carried large quantities to Manilla, while Rumphius says "The Chinese in their own country have very elegant round oranges of the second variety, which are smaller than the common kind. These they preserve whole in sugar, by making fissures in them, and flattening them into the form of large discs. In these little or no bitterness can be detected. They fill jars with them and export them to other countries. * * * The Chinese also send these same oranges, wholly, dry, wrapped in paper, to other countries." I saw in the Siamese exhibit at the Columbian Exposition several jars of mandarin oranges, Kumquats, etc., preserved in thick half-crystallized syrup in glass jars, but none of the European types of China oranges preserved in this manner.

This class of oranges moved west from southern China and 300 years ago were little known in India. Bonavia says, "If this type of orange were obtainable on the western coast of India at the time that the Arabs took from there the Seville (Bigarade) orange further west they would probably also have taken it, although the Seville orange is perhaps one of the hardiest known varieties. If it were easily obtainable in China or elsewhere, at the time the Portuguese introduced C. Aurantium Sinense into Portugal, they would probably have introduced this also." He also calls attention to the fact that it was but recently introduced into Europe when Risso and Poitean published their monograph, which was in 1818 or seven years later than Gallesio.

Risso describes two loose skinned oranges, Bigaradier Chinois, which had acid and slightly bitter juice and was for candying in August, and Bigardier a feuille de myrte which Bonavia considers was the mandarin orange.

Bonavia makes two groups of the loose skinned oranges, first the Suntara and second the Keonla and mandarin.

The Suntara, which resemble and probably include our tangerines, he describes as follows: "A small slender tree with slender lanceolate leaves, sometimes as small as those of the common myrtle, and with a very distinct strong scent; flowers small, the main crop of which comes in February or March, and the after, or Dumriz, crop in June or July, during the rains; fruit varies in shape, from the flat oblate-globose to the pyriform, sometimes quite smooth, at others, sub-warty. The color varies from orange-yellow to lobster-red;

it is mostly baggy, with a loose skin, sometimes so loose that the pulp ball wabbles inside it; the white pithy part between the rind and the pulp is frequently almost absent, and the large oil cells of the rind can be easily dissected into balloon-shaped vesicles; the color of the pulp is often much deeper than that of the bloodless kinds of the Portugal type. The flavor varies from very sweet to a mixture of sweetness and sub-acidity (which most of them have) and to a pure acid. The center of the pulp is mostly hollow and carpels loosely adherent. The seeds are green, when cut." The second group, Keonla (probably King), and mandarin oranges, he describes as follows: "The leaves of the Keonla have a different scent, which, whenever recognized, is not to be mistaken; moreover, the shape of the leaf is generally different distinctly crenated and not pointed but unusually emarginate; the principal difference, however, is in the fruit. When ripe it is chagrined and much redder than a Suntara, and unless overripe it is so sour, that it is almost uneatable. Natives don't think much of it, except for keeping after all other kinds have gone out of season. They either keep it for a long time on the tree till it sweetens, or collect it and keep it in its cut state till it becomes sweet. It is usually a good cropper."

He further says, "The mandarin proper, I think belongs to this group but is a totally distinct orange. I believe it to be the same that Risso called Bigaradier a feulle de myrte. Its exterior is so shiny that it looks as if it had been varnished. Plate 116 A. is taken from the Flor. Amboin, of Rumphius. He calls it Aurantium Sinense. His description of it coincides with that of the Suntara orange of India. Loureiro refers to this plate under the name of Citrus Nobilis and De Candolle, under the name of mandarin, gives Loureiro's botanical designation. Loureiro, however, says that his C. Nobilis agrees most with the A. sinense of Rumphius, but even this, he says, does not coincide with his description of C. Nobilis.

The time may come when in this State we will have several varieties of the three groups of C. nobilis oranges described by Bonavia, tangerines, mandarin and Kings, but until this time does arrive and we know more of the distinguishing characteristics of these oranges of the far East your Nomenclature Committee advises that they be entered in the alphabetical list of oranges in the catalogue under the one variety of mandarin oranges. The Nomenclature Committee also recommends that shaddocks and grape fruit be listed in one group, and considers that Rumphius, who first named them limo (or citrus) Decumana and describing four varieties, large and small, calling them all Pummelos is the best authority for doing so. Of the first variety he says, "The fruit has the shape of an apple, as large as a man's head, round or compressed but not so flat as a common cheese. * * * The pulp forms a globe divided into various segments by intermediate pellicles, mostly fifteen or sixteen in number, more or less, arranged as in an orange; this pulp is either red or purplish red, resembling that of a pomegranate, and juicy with a vinous or acid flavor, but in very ripe ones it becomes sweet like currants. * * * Another variety of this first large kind is very similar to it, or a little smaller, but with a whitish pulp and acid or insipid and watery flavor." Of the second variety he says: The fruit of this second species is smaller, not globose but pyriform, resem

bling winter apples * * * * * the pulp is redder than the common one and has a hollow center. It rarely has seeds; indeed, some are wholly seedless." "The flavor is sub-acid." "The third species of this tree bears fruit of the size of a globe or ball used in the game (name lost). Round the stalk it is equally gibbous, its skin is neither very thick not bitter but is hardly edible. Its pulp is white, very juicy, acidulous and in the ripe fruit sweeter. This variety is rare in Amboyna, and is there called Japanese as it was first brought from there."

The fourth species had both white and red pulped varieties, and he says, "Its fruit is largest of all * * * five or six hang from one stalk and are covered with foveoli. * * * * The pulp is white, more juicy, and sweet than in the common ones. I• has hardly any seeds. Some smaller ones in their upper part (apex) bear a new layer of rind; others within this have a small pummelo of the same substance, color and flavor as the rest of the pulp. This, however, does not occur in all, but only in a small number of the fruit of this kind of tree, and this phenomenon is mostly met with in those from Banda, whence this fruit was brought to Amboyna. The seeds of such fruit, sown in the latter place, readily germinate, and produce strong and perfect fruit, but they very rarely contain a second pummelo. In Botavia there are pummelos also with a white pulp, but the red ones are preferred. * * * * * The fruit of these exceeds in size a man's head; their pulp is red, juicy and acidulous, resembling half ripe grapes, and if hung in the house they keep good for a year." It would therefore seem uncertain whether pomelos were called grape fruit from growing in clusters or for their grape-like flavor, or both. Bonavia says there are decumana in all species of the citrus growing in India and attributes them to the rich soil and abundant heat and moisture of certain localities. Vice versa, the Pomme de Adami (European grape fruit) and Malta blood orange might result from centuries of stunting and chance hybridizing in the poor soils, bleak exposures and cold winters of Malta, and other parts of southern Europe, for the Pomme de Adami can be traced back to nearly as early dates as the sour orange.

Mr. President, this retrospect is necessarily of a cursory nature but your committe trusts enough has been said to show the Society that oranges among citrus fruits deserve a systematic derivative classification that will round out the Society's catalogue and place them in the same bird's-eye-view position that is occupied by deciduous fruits.

PROFITABLE PEACH GROWING IN SOUTH FLORIDA.

General Cultural Directions—Remedies for Borer—Careful Packing Necessary—Varieties—Root-Knot.

Paper prepared and read by Walter Cooper, Sorrento, Fla., Member of the Standing Committee on Peaches and Plums, with discussion following.

[SEE MINUTES PAGES 1 TO 5, ITEMS 36 AND 37.]

Mr. President and Fellow Members of the Florida State Horticultural Society: I arrived in your State in December, 1880, drawn hither from Massachusetts by the seductive, but fairly truthful reports of friends here, of the healthful climate and pleasure and profits in orange culture. I proceeded to plant out a grove the following spring, small in acreage, but proportionate to my capital. The peach industry had not opened up at that time. In a year or two the Peen-to and Honey varieties were introduced, and I became interested at the start. Only a small number of trees were planted then, as the prices were high. I planted a few of the Bidwell Early and Late the first year after they were put upon the market. The price of trees at that time was $5.00 for ten trees, so I cut buds from my trees the following June, after they were set out, and sent them to Delaware; they were budded there and the trees returned to me the following fall. That fall I planted my first peach orchard, setting them in diamond of a young orange grove, one year planted. Both had an even start. In two years the peach trees took the lead. The peach trees were planted on a very good quality of high pine land, underlaid with fine bed of clay, six to seven feet below the surface. This proved a very profitable investment, and for several years paid all expenses of culture and fertilizing of both peach and orange trees on the same tract, and today, after ten years, those trees are in good order and productive. The Bidwell Early were killed to trunk or crotch by the freeze; Bidwell Late partially so. Both gave fine crops of fine fruit last year.

Of late years I had noticed the call was becoming general for free-stone peaches—the success of the Angel, Imperial, Florida Crawford and some others creating a larger demand, and I became converted. In the Spring of 1895, immediately after the freeze, I began to increase my acreage. What I had followed as a side or temporary business, I have now adopted as one of the most profitable. I know of but two crops in the way of fruits that I can now recommend to my neighbors as money producers, those are peaches and oranges, with the orange question sid-tracked for

two or three years more. I have placed my sole reliance on peaches, and to that end have added five acres more since January, 1896, besides having been instrumental in the planting out of over twenty acres since January, 1896. My faith in peaches is firm, founded on ten years' experience and observation—but not all who plant out peach orchards are successful. I have in mind some fifty acres or more that have been abandoned—there was a reason—they were not profitable. And under the system that many follow hundreds of peach trees now being planted will never be profitable, by such owners.

I shall be considered one of those bugs that have been so injurious to Florida in the past, but I am showing my faith by my works. I cannot do justice to this subject, now I have begun, without pursuing it to the end, even at the risk of my paper becoming tedious. No man is too poor to experiment on a small scale. So I have planted out in my time nearly all of the varieties, old and new, that have been recommended for central Florida, and from that experience, still going on, I am selecting my varieties for general grove culture. The present is an off year with peaches in our locality, only the two and three year olds having a fair crop. A grove of 200 trees from which were shipped nearly 700 crates last year, have only 150 crates this year, and this on only one out of four varieties. All were allowed to overbear last year, a fair crop dropping to the ground; no system of thinning out was practiced by the owner, hence fruit was of all sizes and in clusters. I would urge upon all, who enter this field, the importance of thinning out the fruit; this will in a measure correct the over-production of undersized fruit one year, and an almost total failure the following year. It pays everytime to cull on the trees. Experience has proved it to be a costly mistake to allow culls—stung fruit and ripe drops to remain and rot under a peach tree or within the orchard. They should be raked up, fed to hogs or destroyed. They become the main source of the remarkable increase in fruit stung by curculio or other such pests in years following such neglect. I am of the opinion where no fruit is allowed to rot or remain under trees and clean culture followed, loss of crop and inferior fruit from this cause will be wonderfully reduced. All Peen-to and Honey strains are liable to set too many; in some instances I have seen an entire crop lost as too small and bitter for any use, by overloading. A drouth in May will aggravate the destruction from this cause.

Again while I know some shippers have marketed early varieties at a profit, even when dreadfully wormy, small and bitter, this course is to be condemned; it does injury to our State and all who follow them with fine, marketable fruit. There should be no seconds in peaches, except in size. I have been successful by selecting responsible dealers in the State and out, and keeping with them from first early until last peach shipped. Express rates on this class of fruit are high, worthy I think of your attention. I am anxious that as many as can shall engage in peach culture, believing the larger the business the better is our chance for a reduction in rates of transportation.

SOIL, LOCATION, ETC.

I would select any good, high pine land, clay sub-soil preferred; would plant on virgin soil only, no old grove lands would suit me at all. Clear a piece for your purpose. I am planting now 18 feet apart, so

it will pay me to plant a solid peach orchard. One can set out a mixed grove, peach and orange, both to go out the same year. No crops whatever that will carry a germ of Anguillula (or root knot), such as sweet potatoes, cow peas, musk and water melons, etc., should ever be planted in or near a peach orchard; no land they were ever on is fit for peaches in South Florida to my notion. Once root knot gets hold its an up-hill fight, with all the chances in favor of root knot. Should it enter after trees are two or three years old the battle is not so bitter, it can be in a measure outfertilized, but if present at the start, it is best to abandon that plot, or better still do not start.

I have seen this spring a small orchard, finest varieties, planted out on last year's sweet potato patch; the ground is all covered now with fresh green vines, the trees were not topped at all and no laterals cut off—set out just as received from the dealer. That orchard will be a failure, it will scarcely survive two years' time.

I know of another young orchard planted this spring, of about 150 or more trees, set about 18 feet apart. It had a fairly good start, but the owner planted a continuous row of watermelons up each centre —the vines are very early and extra fine— the trees are yellow leaved today. In my opinion it's a failure at the start. No after care can overcome the crop of root knot now planted by the million on these tracts, and I fear no competition from such sources. How many such there are elsewhere I know not. I have combatted this disease in odd spots in various groves too long not to be able to foresee the result there.

The peach borer is a serious enemy to combat on some soils. Its not present in such large numbers on all. The low bottoms with hard-pan sub-soil I find most subject to it. I have removed from eight to twelve borers from three year old trees where neglected on such soil. The higher land is least liable to attack, but all locations are subject to them. Go over all trees twice a year for first three or four years, dig them out with sharp knife and small wire hook. I have seen trees seven-eighths girdled by them. It would be folly to underestimate their destructiveness. There are various washes recommended for trunks of trees; soft soap painted on in month of May sounds good; I am watching an experiment with coal tar. I would not dare use it until fully tested.

Another remedy against peach tree borer is four gallons white wash, two quarts clay, (fresh) two quarts fresh cow droppings, three quarts wood ashes. Mix all together and stir well. Apply with an old broom to stem and crotch of peach, apple tree, etc., in April and May. It is wise to go two inches below collar of trees.

I place great importance on picking and packing, and know of many expensive mistakes by shipping too ripe fruit and careless packing. I use six basket-carrier, packing fruit systematically in baskets, 2-3, 3-3, 4-3, etc., a little smaller at bottom, according to size of fruit, sizing with the eye, all laid in layers, baskets well filled, cover has to be crowded some. I know of serious loss and disappointment to shipper and dealer by neglect or carelessness in packing a very fine lot of first class peaches. Care must be exercised to pick fruit when full grown, but not ripe; go over them often and pick close every day; this calls for skilled help and not small boys; fruit is handled with more care than eggs; to ar-

rive bruised and mostly mush means a dumping out or goes to a bargain man.

VARIETIES.

I am still planting a few of old tried cling-stone, such as Peen-to, Bidwell Early and Late and Maggie; do not wish to run out of these sorts. For a main crop early free-stone I am trying Jewel; it is promising well so far; Waldo, second. Both of these are too small to suit me; culling close will improve size. Angel is a success. Imperial and Oviedo, July, Success, Florida Gem, June, very promising. Colon, good bearer, but rather small. Triana, Ferdinand, shy and too late. Florida Crawford is a grand peach, but only a fair crop alternate years, a few trees being desirable. Early Cream, Florida Own, not recommended for orchard against other sorts. Powers, September; Gibbons, October, I am testing; would advise mixing, planting some of earliest and latest. Late frost and spring drouth cuts off early kinds. Angel, Imperial, Oviedo generally come in with some rains and size up nicely. Clean culture from early spring until end of August is my choice; have known loss of good crop by stopping work first of July, allowing trees to become dormant, and early and second early out in bloom at Thanksgiving. Work and push them late. Any complete orange fertilizer will answer. I use Fruit and Vine, applying an extra dose of sulphate of potash; used muriate this year. I use only common sense in planting, prefer three to four or four to five foot trees, buying best I can afford, cutting cane back to two or two and one-half feet; cut off all lateral branches, prune all bruised roots and main roots back to five or six inches. I attend to these close the first year, rubbing off all shoots 18 inches or so below top, doing it twice up to May 1st. Fertilize twice, one-half pound at a time, will get two and one-half to three by July 10th. Larger trees, three years old will get seven pounds by July 10th.

I used to think a peach ripening as late as July too late for Northern markets. A careful note of last year's business dissolves that view. First class, selected Florida peaches, Imperial and other varieties arriving to market in good order, sold at top prices in competition with California and Georgia Elberta, 10 crates, 10th of July, '96, brought $2.75 and $3.00 per crate, with urgent calls for more like them at same or better prices, but $1.75 for same fruit in State markets was considered good enough, so sold at home.

By all means plant a peach orchard, but on new land, with tested varieties; provide for clean culture, liberal manuring; cull the fruit close on tree when size of walnut, hunt for borers not less than once a year and get them all, pick at proper time, not too ripe nor too green, pack with care and fill baskets full, provide clean packages, select responsible men to handle your fruit, then provide a big stocking and wait for the sheckels to roll in.

A member: I would like to know if he knows any way of keeping the borer from getting in?

Mr. Cooper: I explained one way; there are three or four remedies; one is soft soap; carbolic acid or coal tar, but the soft soap remedy seems to me to be all right.

Mr. Bacon: How long would the market of Florida help you out in case the peach culture was continued, and how late can Florida ship peaches North in competition with Georgia?

Mr. Cooper: The last of mine now ripens about the middle of July; they were

selling in Tampa, peaches three for a dime the latter part of July; these peaches were indifferent in quality and size. I have satisfied myself the market in the North is good for peaches until July in competition with any peaches.

I was called in to help pack fruit last year on a grove that contained a matter of four hundred crates of the most magnificent you ever set eyes on. The day I was called in to look the crop over I was surprised, and asked the owner when he intended to ship; he said "when the fruit is ripe." I said, "you have four crates on top of every one of those trees to-day over ripe. We finally made an agreement and we went in to pick them, and it took us a week to catch up with that fruit, but we were too late. It took us all our time day and night to catch up, going every morning and picking those just ripe. Sent some to Richmond, Virginia; those peaches sold at $2.75 and $3.00 a crate in July.

A member: How many trees did you say there were?

Mr. Cooper: Eighty-five trees.

A member: Do you wrap your peaches in paper as we do tomatoes?

Mr. Cooper: I used to but dealers objected to it—they claim it sticks to the fruit to the injury of it—I use none on top layer—a clean smooth cover is preferable.

A member: Do you use excelsior in packing?

Mr. Cooper: Not lately; I like it but if you use enough to be of real service there is likely to be a complaint of contents of package.

Question. About those four quart baskets, do you lay three or four deep?

Mr. Cooper: Three layers as a rule; occasionally Waldo may require four layers. Baskets are filled to crowding; package cover requires crowding down some; packed thus if fruit is firm, they carry well and arrive to market in good order.

You know the greatest cause of failure in Florida both in peach and orange shipping has been in the fruit arriving in bad order, and this is in the packing. A man who raises a good article will get a good price. I have sold peaches for $11 a bushel. I have some new varieties very handsome trees, very pretty tops, and I do not mind that the trees have a few fruit on. They had a fair crop last year. I have two groves with a number of trees in, two year old trees, two and one-half inches through. I have made a business of going over the tree and leaving no peach nearer than that (indicating three inches) if five or six I will take all off and leave two or three, and I expect each one to be a desirable, marketable fruit. I will get it in measure if I do not get it in number.

Mr. Carey: Some one asked about the borer. My experience of 25 years with peach orchards is to prove the grub does know enough to go in out of the rain, and you can use all the insecticides you want, but the only way I have found is to dig him out.

Mr. Bacon: I would like to ask any gentleman in regard to the root knot from the cow pea. An article in the Agriculturist stated the cow pea had no bearing with the root knot on the peach or orange tree.

A member: The cow pea has a very material bearing. I would not plant peach trees on land previously planted with cow peas.

Mr. Bacon: Do you think a few drops of kerosene would injure the tree, dropped In the hole of the borer?

Mr. Cooper: I do not know. As soon

as I find the hole wide enough to put this wire in I pull the borer out.

Mr. Wright: In regard to that question of root knot one of the oldest nurserymen in the State of Georgia says there is no such thing; that the substance on the roots of the cow pea are simply receptacles for nitrogen, and land planted to cow peas is enriched and it is beneficial to peach culture. That is Mr. Berckman of Augusta, Ga. My observation, which perhaps is not worth much, is strictly in that line. Mr. Robinson, who is a resident of this town, gives the same testimony. There seems to be a large diversity of opinion on this subject. Perhaps it is well enough to give the cow pea the benefit of the doubt and not plant, but I would not hesitate one minute if I wanted to enrich my ground by planting cow peas and turn them under for fear of root knot.

Prof. Rolfs: A word further in regard to the root knot. It is a microscopic worm and grows on the velvet bean as well as the cow pea. I think we will find it a fact that the best authorities agree, that it does attack the cow pea; I have also discovered it on the velvet bean. If we take the bulletin published by Dr. Atkinson from the Alabama Experiment Station, (now professor of botany in Cornell University) we will find he has found it on the cow pea. There is no doubt about nitrogen tubercles growing on both plants. I think a little microscopic work in this connection will clear up the whole matter.

GRAPES.

Report of Standing Committee on Grapes. Paper prepared and read by C. A. Bacon, Chairman of the Committee on Grapes, with remarks preceding the paper.

[SEE MINUTES PAGES 1 TO 5, ITEM 61.]

Mr. C. A. Bacon: The members of this Association have no doubt, wondered why certain members are placed on certain committees. Our late President, of course, is not present to explain those things. I take it that it is for this reason, to get the ideas of certain men on different subjects, not always scientists and specialists, but getting the ideas of men, who are having daily experience with these different things. We have just had a sample of the scientific part of this business, and when we got through, as I remarked, it was hard to tell "where we were at." I believe that every member of the Society should accept a position on any committee and do the best he can either verbally or written; of course it is preferable that each individual should hand in a written report, no matter what you say. It goes to the secretary, and he can change it so it will be fit for publication and record on the minutes of the meeting and in the annual report. If a term gets in which the secretary does not understand, he will write you and you can correct it, and perhaps it is good that we

should understand this. A great many men hesitate about making a verbal report, for fear they will say something which is not proper or grammatical. I am simply making these remarks for the reason I am glad to find them out myself.

PAPER ON GRAPES.

Mr. President, Ladies and Gentlemen: Why I should have been selected as one of the Committee on Grapes is a mystery to me, but perhaps it was for the reason, that the raising of grapes in Florida for the market at a profit is still a mystery, and believing that "A man can learn something from any fool," I was selected. Fortunately, in one member of this committee you have a man, who is able, and willing, to give you five pound bunches of wisdom on grapes, and at the price of the last quotations of Orlando Niagaras.

We believe that there is a grape, or that there can be made a grape, that can be put into market at a time when large profits could be realized. There is a fortune for the man who introduces it. But would it remain a permanent success? No, there are always four hundred and eleven fools, who will always spoil a good thing when they see it. How was it with the Niagaras? Forty cents per pound. Then up jumps members of the aforesaid four hundred and eleven pick their grapes green ship them in crazy crates to the green Yankees. Did they buy them? Oh yes, one box apiece all around; that settled it. Some twelve years ago we planted a white Chassela vine; it grew beautifully, the second year it bore, the third year it was loaded with most delicious grapes, the fourth year it died. Grape men said it over-bore; foolish vine. We had a Herbemont that tried to take possession of the whole place. I expect it would have been in Africa by this time if it had had telegraph wire to run on. It bore bushels of grapes, but did we get any? Oh, no! They are just the right size for the Cardinal bird, and the Mooking bird. We have finally settled down on the old reliable scuppernong, and its daughter, Miss Thomas. We only have three vines. We don't need any more. All we need to do is to extend our arbors from year to year and they will get there.

What more pleasing pastime than to stand under a scuppernong vine three times a day, and eat, and eat all you can, start to go away, then go back and eat a few more. And wine? Well, get Von Luttichau's recipe for scuppernong wine, and your friends will say it is the best wine they ever drank. We never drink wine; hardly ever. We believe there is money in putting up unfermented scuppernong grape juice. Put it up in handsome bottles, not soda water and Warner's Safe Cure bottles; put on a beautiful label, send a case to the president, or better still to a doctor with a large practice in a large city, and you will soon have to plant more vines. See? There are tricks in all trades, except the horticultural. Possibly you disagree with me in some things I have said. In that case my object is accomplished, it gives a chance for an argument. This is about all I know about grapes. If you have't anything to say, don't say anything and say it quick.

GRAPES IN SOUTH FLORIDA.

Paper prepared by O. R. Thacher, Avon Park, and read by the Secretary.

[SEE MINUTES PAGES 1 TO 5, ITEM 62]

Mr. President and Members of the State Horticultural Society: Having been made one of the Committee on Grapes by our late lamented President, I feel I ought to contribute what I can, although but poorly qualified to give instruction on this subject.

In looking over such copies as I have of the proceedings of the annual meetings of our Society, I find that in 1892, grapes were considered exceedingly promising in South Florida. In the annual meeting of that year at Ormond, one gentleman said: "We propose to make it (the growing of grapes) a success;" it can be made just as much a success, and is just as sure as the orange." That was only five years ago. Then everything looked bright for profitable grape growing. In 1894 it was another story. Gentlemen told of their losses, of their failure to reap any profit from their shipments of fruit, and some expressed extreme disgust with the whole business. However, all appeared to agree that as fine grapes had been raised, and could be raised in South Florida as anywhere else without unusual difficulty, but facilities for their safe transportation to Northern markets were lacking. The Chairman of the Committee on Grapes that year reported that "not over one-half of the the vineyards are being worked, and lack of remunerative prices is the cause." He further said: "There must be first-class, rapid refrigerator service at reasonable rates, or the grapes must be manufactured into wine."

In 1895 there does not appear to have been any discussion of grapes in the annual meeting of our Society. The overwhelming frost disaster which had befallen the great orange industry of the State overshadowed every other subject. In 1896 the brief chapter of experience on the subject of grapes revealed only losses to those who had invested in the growing of that fruit for market.

At the present date the growing of grapes in Florida, or in South Florida, at least, for the markets of the North, appears to have shrunken to very small proportions, and there are reports of vineyards being offered for sale at only a tithe of their cost. Must we conclude then, that there is no future for grape growing for market in Florida, or in South Florida? Is it too much to hope that, sometime in the future, quick and safe transportation will be provided for the most tender and perishable fruits, and that systematic distribution will be provided for, so that all parts of our country may be supplied with Florida grown grapes of excellent quality, delivered in perfect condition. This is a ques-

tion as to the future only. At present it seems that this cannot be accomplished.

But, surely, every man, who lives upon his own land in Florida, be it little or much, may provide himself and his family with as much of this healthful fruit in its season, as they can use, by only a little labor intelligently and promptly applied. If a man will only learn how, properly to care for his vines, and then attend to them in season as regularly and certainly as he goes to his daily meals, he can easily grow many kinds of as fine grapes as can be grown anywhere else in the open air.

One of my neighbors has a Niagara vineyard of some four acres, five years planted, located near his dwelling, on the top of a hill fifty or sixty feet higher than a beautiful lake, which it overlooks. The sand is very poor and very deep, the clay being not less than thirty feet below the surface. He was a practical gardener of many years' experience at the North, and has taken intelligent care of his vines. He has succeeded admirably in growing grapes, but not in making money out of them.

I have another neighbor, who has a small vineyard, planted for home use, on land equally as poor as the other. He has the Niagara, and also the Delaware, the Green Mountain the Diamond, the Agawam, the Goethe, and several others. He thinks highly- of the Green Mountain and Delaware. The Goethe is with him an especially strong grower, and seems to flourish as well in the poor sand as if in better soil. Still another neighbor finding wild grape vines growing vigorously out of the poor sand, among the pines upon the high hills surrounding our lakes, transplanted some of them to his yard, it being the same poor pine hill soil, and there grafted them to Niagara, Diamond and one Black Hamburg. They have all done well, the latter having now a large number of very fine bunches of fruit growing upon it, and the Diamond also showing fine, compact bunches and plenty of them.

Surrounding some of the lakes of southern Polk county, there are perhaps hundreds of acres of pine hill land upon which I have seen an abundance of wild grapes flourishing and fruiting. Now upon all such lands, and perhaps upon those grape roots as stocks, many of the best native grapes of the United States can, no doubt, be successfully grown. And everywhere throughout our State those who will, may, I believe, succeed in growing some good varieties of grapes. That old stand-by the scuppernong is not to be despised and must not be neglected.

Now, whether or not grapes can be grown for market at a profit, in Florida, I think this Society ought to encourage and urge upon all farmers and fruit growers and all who occupy the soil, the importance of growing a home supply of this health-giving fruit, the grape.

FOREIGN GRAPES IN FLORIDA.

Results of Experiments in Foreign Varieties in South Florida on their own Roots and Grafted.

With discussion following.

[SEE MINUTES PAGES 1 TO 5, ITEM 63.]

Mr. J. B. La Montagne of Winter Park, was requested to relate his experiments in grape culture in Florida and responded as follows:

Mr. President, Ladies and Gentlemen: I do not think I have as much wisdom as the President seems to imply. However, I am quite willing to tell you what I have been doing in the past years as regards the culture of grapes.

Nine years ago a Frenchman and myself went through the different vineyards of Orange county, and we came to the conclusion that the Niagara, as a market grape, would be a failure. This forecast proved to be the truth.

I then made preparations to procure some European varieties of grapes, and secured from California some Chasselas, Muscats, Verdals and others on their own roots, but these after two years were dead.

Thinking that these vines might have been affected with diseases peculiar to California, I ordered from a friend in Marseilles (France) 200 varieties of grape vines still on their own roots, but these after two years of care bestowed on them proved another failure. Their roots on examination seemed to be affected with what I should term root mildew, causing the roots to die back.

Undaunted by this second failure, I ordered another shipment from France, but this time, of vines grafted on hardy resistant stocks such as Riparia, Vialla, Solmis, Aestivalis, and Rupestris. All of these grafted vines have done well for the past four years and today I can count on some from 12 to 15 bunches. These grapes belong to the Vinifera class, which, it was supposed, could not grow in this State. They grow compact, produce large bunches, from the golden yellow of the Chasselas, the pink of the Clairettes, to the violet and black Muscats, rivalling with each other for beauty, firmness, transparency and sweetness.

Their richness in saccharine matter is very high, and as shippers, they cannot be surpassed. I have had some of these grapes ready for the market on the fifth of June, and I have kept some others three or four weeks in the house, without a single berry dropping from the stem.

In France where there are four million acres in grapes employing eight million

people, it has taken centuries to decide which is the best grape for a given department; ten years of experience in Florida should only mark the commencing of experiments and others should unite with me their efforts in that line.

Italy and Algeria have nearly the same climate as our State and they have three million acres in grapes. I do not see why everyone, every farm, every grove should not have its little vineyard of foreign grapes which I consider quite adapted to this State.

QUERIES.

A member: Do you find the use of potash sweetens the grapes?

Mr. La Montagne: I have not made many experiments to that effect but, the nature of the grape itself has more to do with it than treatment, as I have growing side by side, some very acid grapes and others exceedingly sweet though subject to the same treatment. For instance the juice of the Niagara grape will show per gallon only eight to ten ounces of sugar whereas the foreign grapes will show up to 24 ounces.

A member: What stock do you use for grafting?

Mr. La Montagne: As already stated, I am using several for that purpose, the Cynthiana, Norton, Herbemont all belonging to the Aestivalis family have given me satisfaction as a grafting stock.

A member: Have you grafted on the Niagara?

Mr. La Montagne: The Niagara in the list of Pulliat's resistant stocks is only given six points whereas twenty are given to the highest resistant stocks and consequently is not adapted for grafting. The Niagara belongs to the Labruscas and that family does not succeed here.

A member: Have you tried Scuppernong as a grafting stock?

Mr. La Montagne: This same question was brought up last year by one of the eminent professors of the Experiment Station. Pulliat, the great French viticulturist decided this question 25 years ago. He proved there was no affinity between the two. The Scuppernong belongs to the Muscadine family; its wood is hard, it has hardly any pith and its bark does not peel; owing to the great difference between the two, the foreign or vinifera grape does not succeed on the Scuppernong.

Having read in the "Florida Farmer and Fruit Grower" that Munson, the American Hybridist was advising for the South the setting out of the Post Oak grapes, I will take this opportunity to state that Pulliat tried this variety twenty years ago and found it of no value whatever.

INJURIOUS INSECTS OF THE YEAR.

Injurious Insects of the Year. San Jose Scale—A Fungus Parasitic Bean Leaf Roller—The Pustule Making Scale –Thrips—Phytoptosus of the Tomato.

Paper prepared and read by Prof. P. H. Rolfs, of the Florida Experiment Station, Lake City, Fla., Chairman of the Committee on Entomology.

[SEE MINUTES PAGES 1 TO 5, ITEM 84.]

It is without doubt profitable for Florida State Horticultural Society to make a retrospect of the important occurrence since its last meeting. I have, therefore, at each meeting placed before Horticultural Society each year a brief resume of the more important insects depredations in Florida and have called attention to such other pests as threaten us but are not on our soil. It is out of place for me to argue the importance of economic entomology; you have experienced the effect of insect ravages and know that it is not an unusual occurrence for a single species to destroy the profits of that crop for the year.

When a crop is not profitable it has to be abandoned sooner or later and thus while only a small per cent. of the product may be destroyed the crop is a failure. To make our profits as large as possible, we must use the most improved methods for destroying our insects and the most judicious means for keeping the pests, that are not already here, out of Florida.

The advice in both particulars have been kept unusually well by a large majority of the Florida Agriculturists and Horticulturists. But we are suffering severely from the attacks of pests brought into the State before this strong moral quarantine was established. I will not weary you with the long scientific discussions and minute details but will make my paper very brief omitting the long array of data, but will give to you the facts deduced there from.

THE SAN JOSE' SCALE.

(Aspidiotus perniciosus, Coms.)

This insect has received attention from the Florida Experiment Station since March 1894; that the people of our State appreciate the amount of damage it can do has been demonstrated by the large number of scale insects that have been sent to us for determination. There have been no new stations of infection added to our former lists but the insect is not entirely subdued at DeFuniak. Last year the New Jersey legislature sent their Experiment Station Entomologist, Dr. J. B. Smith, to California to study the conditions of the San Jose Scale there. It is well known that this insect is present in many orchards of California without increasing so rapidly as to become destructive. In other words,

there seems to be a natural check to their excessive multiplication.

The New Jersey legislature wisely appropriated, $1,000 to send this expert to those orchards to learn the reason for this condition of the scale and, if possible, introduce that enemy, or enemies, of the pernicious scale to New Jersey.

The destruction of this scale is credited to several species of predoceous and parasitic insects; it was therefore eminently proper to send an entomologist to ascertain what the necessary condition for these latter insects may be. Before Dr. Smith left New Jersey we made arrangements with him whereby some material might be sent to us. We colonized, and hoped to establish, the insects, because our climate is very similar to that of California.

During July 1896 four separate boxes of insects were received; these were divided into six colonies and placed in as many orchards. The shipment consisted of a mixture of several species of predaceous insects. Immediately upon arrival the insects were placed in glass cages and fed on San Jose scales for two or three days. This being in the rainy season it was deemed advisable to protect the insects against storms, so muslin covers were constructed over each tree upon which we colonized the insects. Each tree received from sixty to a hundred insects but in an hour's time after they were liberated it was difficult to discover a single one. The weather remained dry for a considerable time making it very favorable for the predaceous insects and the past winter has not been severe on them. We should be able to see some beneficial effects from them this year, if they are to be a valuable acquisition. At present I cannot report definitely upon the results.

A FUNGUS PARASITIC.

As mentioned before, the Experiment Station has given special attention to this pernicious scale since it was discovered in Florida, in March, 1894. Its progress and destructive habits have been noted from time to time and a constant vigilance has been kept. During the spring of 1895 suspicions were aroused that there was something working to retard the progress of this pest. A careful search brought nothing to our attention except some insect enemies which were not in sufficient abundance to merit special study.

In May 1896 I visited DeFuniak preparatory to colonizing the insects to come from California. At this time a careful survey of many of the previously infested orchards was made and the suspicions of the previous year firmly established.

The Rose Hill Fruit Farm had been among the first to suffer from San Jose scale, it had been sprayed but once, and was now entirely free from scale. The proprietors had noticed this for some time. A careful searching for scale in this orchard was made but none were discovered. Several other orchards were visited but the scales in these were in a flourishing condition. The search was next directed to orchards that had not been sprayed. Upon inquiry Mr. Mellish took me to Mr. A. C. Bailey's orchard. Mr. Bailey had noticed that the scales were not so bad as they had been and that some trees were entirely free.

On examining this orchard it was difficult to find trees infested with scales while in 1894 it was difficult to find a tree that was not infested. Every tree that was in-

fested with scales contained scales diseased with Sphaerostilbe coccophila, Tul.

The evidence was almost sufficient to be considered conclusive. The same orchard has been visited since that time and the last remnant of the scale is gradually and surely being killed out by this fungus. As this subject is of great importance to the fruit growers of the South I will speak more in detail of this disease of the San Jose Scale on a later page.

I next visited the orchard belonging to Mrs. Newell. This one had been badly infested and practically abandoned. In this not a trace of live scales could be found but all the dead limbs and dead trees bore quantities of dried scales after considerable searching a few specimens of this fungus were found. The battle had been fought to a finish,—the fungus destroyed the insect and thereby exterminated its own food supply.

From the foregoing statements it should not be inferred that this is the general condition of the pernicious scale at DeFuniak but these are only the best examples in that whole section. Many orchards are being ruined by it and other young orchards are becoming infested from their neighbors trees.

As a whole we may congratulate ourselves that the scale is not distributed in many localities. This does not protect us, however, from invasion nor does it protect a neighborhood against a careless and thoughtless neighbor.

THE BEAN LEAF ROLLER.

(Eudamus proteus.)

This insect is a native of the State but seems to have acquired a taste for beans. It folds the bean leaf over and then hides in the fold, and feeding on the leaf from the inside portion. This larva is an odd looking animal. It has a large head and a slender neck, characteristic of the larvae belonging to this family of butterflies, the skippers, (Hesperidae).

The habits of this insect are so characteristic that I scarcely need to describe it further. When the insects are not numerous hand picking will be found the most practical. Arsenites may be used with good effect.

THE PUSTULE MAKING SCALE.

(Asterolecanium pustulaus, ckl.)

During March 1897 we received specimens of the above scale from Mr. J. J. Fox, Georgiana, Florida. Mr. Fox, in his communication said that it was killing his fig trees. Judging from the specimen he sent to us there can be no mistake in his statement. He stated further that he had used kerosene emulsion and also strong soap suds without killing this pest. It is therefore of unusual interest.

This scale was introduced from the Sandwich Islands and ordinarily infests the oleander, but in this case has taken up a new food plant. The fig is not an important fruit in Florida but we do not know where this change of food plant will finally take this scale. In this connection I cannot do better than quote Prof. T. D. A. Cockerell, of the New Mexico Experiment Station.

"The behavior of a species in a new country is frequently different from that in its native locality. Being without its natural checks it will sometimes increase inordinately, as did the Icerya purchasi in California. The San Jose scale, so destructive in the United States, attracts so little attention wherever it originally came from, that we do not to this day know with any certainty its original habitat.

Specie closely allied to the San Jose

scale, natives of the United States, are not nearly so destructive. The red scale of the orange, Aspidiotus aurantii, in Jamaica never infests citrus fruits, but occurs on lignum-vitae and palms; how different are its habits in California! In Japan there is a scale almost exactly identical with the San Jose scale, which infests citrus trees, which the real San Jose scale never does in America. Therefore, in view of such facts as these, we can fairly say that we never know what we are in for when we introduce a new scale."

THRIPS.

These insects have been unusually abundant this year and seem to be very hard to treat. It is very difficult to reach them with the ordinary insecticides as their main place of abode and breeding is in closed blossoms in such cases as the strawberry, while a few cases are reported as feeding on other insects; the greater number are destructive to plants.

The species most abundant in Florida has been referred to as Thrips tritici. The specie that has been doing most of the damage to roses and strawberries at Lake City and those that have been sent to us for determination seem to belong to the genus Liniothrips.

The life, history and habits of the American species have not been published. This study is circumscribed by many difficulties.

Nearly all entomologists who have published on this insect have advised the use of insecticides that kill by contact; such as resin wash, kerosene emulsion, etc.

PHYTOPTOSUS OF THE TOMATO.

(Phytoptus calcladophora, Nal.)

This year has been marked by several severe outbreaks of this insect mite. The names used by some tomato growers for this disease are quite various. The most common one seems to be mold, which of course is entirely erroneous in as much as the disturbance is due to minute animals and not mold (fungus), at all. Some of the tomato growers told me in 1893 that this disease caused greater loss to them than all the other diseases combined.

During favorable seasons this phytop spreads with surprising rapidity, especially when we remember that it has only four legs and no wings at all, but you are all familiar with the orange rust mite, Phytoptus citri (?) and from the name you will see that they are cousins. (It requires a compound microscope to discover the specific differences.)

Following the information obtained from treating orange rust mite, I suggested the use of sulphur spray and flowers of sulphur. (It was not practicable for me to make the experiment.) From the number of letters that report these substances as effective remedies, it leaves no doubt in my mind as to what I shall advise in the future. Flowers of sulphur has proved itself a complete remedy in ten days. This substance can be applied from the primative dusting can, or dusting bag, or from the improved machine called a powder gun.

This complete and inexpensive method of combatting this very destructive disease to the tomato crop is a very important discovery.

INSECT DISEASES.

An Interesting Field of Economic Entomology—Diseases of the San Jose Scale—Hymenopterous Parasites—Coleopterous Enemies—Other Diseases—Disease in Florida—Experiments With the Disease—Results of Experiments.

Paper prepared and read by Prof. P. H. Rolfs, of the Florida Experiment Station, Lake City, Fla., Chairman of the Committee on Entomology.

[SEE MINUTES PAGES 1 TO 5, ITEM 85.]

INSECT DISEASES.

This interesting field of economic Entomology owes its origin to Dr. S. A. Forbes, Entomolgist of the Illinois Experiment Station. The first work in this line was done on the cabbage worm, larva of Pieries rapae, in 1883. The disease of this insect has been disseminated, naturally and artificially, until it is co-existent with the butterfly.

Dr. Snow, Chancellor of the Kansas University, has studied and successfully disseminated a disease of the chinch bug, saving to the State in a single year many fold the amount spent by the University.

The Division of Entomology of the U. S. Dept. of Agriculture sent an agent to Australia to secure and introduce predaceous insects to feed upon the fluted scales that were then destroying orange groves in California.

Other more or less successful experiments on the use of insect diseases could be enumerated but the benefits derived from those mentioned are so great that they have won international reputation.

The following question has been asked frequently of me: "Why don't you combat that insect with a disease?" In as much as this, or a similar question, has been asked of me by members of the Florida Horticultural Society, I will assume that there are other members who would like to have me answer this question. The propagation of insect diseases is circumscribed by several rigid limitations.

First. We must have a specific organism that will destroy the particular species of injurious insects. For example, the Vedalia lady-bird (Vedalia cardinalis) is of no economic value in keeping the Florida red-scale (Aspidioter ficus) in check. Dr. Snow's disease of the chinch bug (Sporotrichun globuliferum) is of no value in combatting the fluted scale. Dr. Forbes' disease of the cabbage butterfly is not a success with myriads of insects. These illustrations indicate clearly that a particular disease attacks a particular insect, or it may attack several, or even many species.

Second. The habits of the insect to be destroyed must be such that the particular organism will have access to it. Prof. Forbes' disease of the cabbage worm is

fatal to the cotton boll worm but the feeding habits of the latter are such as to render infection accidental. The cabbage worm becoming sick with this disease dies clinging to a leaf or falls to the ground. This in dissociating liberates the bacteria which are carried through the air, and by myriads find embodiment on a cabbage plant. A fellow cabbage worm feeding on the leaves introduces the germs into his digestive system where the bacterium finds the proper conditions for development, and the cabbage worm comes to an early end. Now the cotton boll worm (Heliothus armigera) eats but a small quantity of the epidermis of its food plant and so decreases the chances of being infected many fold. The greater portion of its life is spent in the interior of its food plant where the disease germs would scarcely be able to reach the worm.

Again the calico back (Murgantia historonica) obtains its food by inserting its beak into the tissues of the plant and sucking the juices from the interior and thus escaping infection from most germs.

The chinch bug disease infects its hosts by spores of this fungus coming in contact with the bug and there germinating. Now when the disease breaks out in a crowded colony of bugs many individuals will be infected. If the colony is not numerous the number of spores produced will be greatly reduced and consequently the chances of infection correspondingly decreased. The number of illustrations might be greatly increased, but my meaning of the foregoing statements will be made clear by these.

Third. The atmospheric conditions must be favorable to the rapid reproduction of the parasite. A warm, moist atmosphere is excellent for the propagation of the disease of chinch bugs while a dryer one is more advantageous to the propagation of the cabbage worm disease.

Fourth. The multiplication of the disease must be very great, or if a predaceous enemy of the insect, it must be a hearty feeder. There seems to be a half dozen different species of hymenoptersus parasitic on the San Jose Scale; they are an important factor in keeping down the scale—they are very efficient but a long way from sufficient. The twice-stabbed lady-bird (Chilocorus bivulnerus) feeds on old and young scales of various species, but the scales are usually able to increase many fold even when the lady-bird has the very best of chances.

It is clear from the foregoing that the rational and scientific method of studying insect diseases is to learn first the habits and life history of the insect that is to be treated. Happily this has already been accomplished in the case of many important economic insects. After the life history of the host insect is thoroughly understood it is then proper to begin the study of the predaceous or parasitic enemy of that insect, and later the predaceous and parasitic enemies of near relatives. The study of the host insect should include study and observations in its native habitat. It is from such sections that we may expect to secure valuable information regarding the suppression of destructive species. In nature, the battles that are to be waged to a finish have been fought and a fairly well balanced condition has been there established.

The fact that no progress was made in the use of insect diseases until the study of the biology of the diseases was begun substantiates the assertion that practical progress in application of insect diseases is

possible only after the biology of the disease has been determined.

A catalogue of the papers published on insect diseases would extend over many pages of the report of the proceedings of the Florida Horticultural Society. Mr. B. M. Duggar of the Cornell Experiment Station, catalogues sixty-three papers on bacterial diseases of insects. This will indicate to some extent the interest and activity in this line of scientific research.

A BACTERIAL DISEASE OF THE SQUASH BUG.
(Anasa tristis DeG.)

Mr. Duggar has made a careful and exhaustive study of a bacterial disease of the squash bug. The disease is due to a bacterium called Bacillus entomotoxicon by Mr. Duggar. Although bacterial diseases of the insects are not uncommon, this seems to be the first one discovered in connection with the true bugs (Hemiptera). Numerous experiments were made to use this disease effectively against other insects but they all turned out impractical from an economic standpoint. I will here quote the summary given at the close of Mr. Duggar's excellent paper:

"Bacillus entomotoxicon is the cause of a characteristic disease of the squash bug first observed as epidemic among bugs in the laboratory birding cage.

"Both laboratory and field experiments show that the disease is readily communicated to healthy squash bugs by contact with the fluids of infected insects, nymphs being more easily effected than adults.

"Fresh agar cultures of the bacillus are effective as sources of infection.

"The disease may be communicated to young chinch bugs either from diseased insects or from culture; but adult chinch-bugs are strongly resistant.

"With the grubs and other larvae hitherto experimented upon, external applications of infected material have given no successful results.

"Infusion from the growth on agar contains an active principle which kills many insects after a very short period of immersion.

"Sections of diseased squash bugs show that the bacillus is present in the blood at all stages of the disease. The hypodermic adipose tissue, and cardiac tissue are also early affected.

"When death ensues the body fluids are like pure cultures of the diseased organism; and accompanying saprophytic germs are seldom found."

DISEASES OF THE SAN JOSE SCALE.

Since this insect is so destructive to the fruit growing industry of the United States much attention has been directed to the discovery of predaceous and parasitic enemies.

HYMENOPTEROUS PARASITES.

Dr. L. O. Howard, entomologist to the Department of Agriculture, has directed special attention to the study of the parasitic hymenopterea. In bulletin No. 3 Div. Ento. U. S. D. A. he discusses six different species that parasitize this insect. Aphelinus fuscipennis, How. is considered the most important one. It is distributed from the Atlantic to the Pacific. It is quite common in several orchards in Florida though not of sufficient number to cope with the scale. Upwards of a dozen specimens were bred in three days from a scaly twig a few inches long. Aspidiotiphagus citrinus, Craw. and Anaphes gracilis How. were reared by Dr. Howard from scales sent to him from Florida.

COLEOPTEROUS ENEMIES.

Chilocorus bivulnerus, the twice stabbed lady bird, has received considerable com-

mendation from several people as predaceous on this scale. It has, however, shown a decided preference for the gopher scale (Aspidiotus juglans-regae, Coms.) in Florida. This latter scale does considerable damage in our peach orchards and is quite as difficult to eradicate as the San Jose scale, but the natural checks seem to keep it more within bounds. Whenever possible the twice stabbed lady birds leave the San Jose scale and go to trees infested with the gopher scale. While we must regard this lady bird as an indifferent enemy of the San Jose scale, it is an effective and valuable friend in protecting us against the other scale.

PENTILIA MISELLA.

A much more effective predaceous insect is this minute black coccinellid. It seems to have accommodated itself to the newly introduced scale in a short time. In 1894 none of these were observed in the orchards at DeFuniak, but in 1895 a few were found, but they are so minute and so few were present that they were not considered worthy of special attention. In 1896 they were present in every orchard visited. In some cases they were abundant enough to do a very considerable good, but in the orchards where they were most numerous there were not so many as one to every thousand scales. They have also been observed in orchards free from scales; just what they feed on in such cases could not be determined. When it will be remembered that they are not half as large as a pin head it will be seen that it is not an easy matter to determine their food habits.

There are several other species belonging to the coccinellid family but these are not present in our fauna though some are well worthy of a trial in our State.

OTHER DISEASES.

Mention has been made repeatedly of suspicion of diseases of a different nature. Mr. Coquillet discovered a condition in some peach orchards of California that led him to believe that there was a fungus disease present among the San Jose' scale.. The following paragraph is quoted from bulletin 26, Division of Entomology U. S. D. A. by Mr. Coquillett:

"A few weeks ago (1893) Mr. C. H. Richardson, of Pasadena, one of the county inspectors of fruit pests, showed me several pear trees in that locality which a year ago were thickly infested with these scales, as was evidenced by the gnarled appearance of the branches as well as by the dry scales adhering to the trees. After careful examination of these scales scarcely a live one could be found. Mr. Richardson assured me that the trees had not been treated with any kind of insecticide, and they certainly gave no evidence of such treatment. The dead scales showed no evidence of having been destroyed by a lady bird nor yet by internal parasites. Wishing to ascertain whether this singular mortality was general among these scales in other localities, I examined several infested orchards in the city but found the fruit and new growth thickly infested with these scales, which were alive and to all appearances in a very thriving condition. It would appear, therefore, that this mortality among the San Jose scales was entirely due to some low form of fungus growth. Specimens of these scales were submitted to Prof. Galloway (see P. 55, bulletin No. 3, N. S. Div. Ento. U. S. D. A.) but nothing of special interest has been reported in this connection."

The following paragraph is quoted from Messrs. Howard and Marlatt. (See P. 51, Bul. No. 3, N. S. Div. Ento. U. S. D. A.) Is very suggestive:

"Aphelinus fuscipennis is undoubtedly a

very efficient aid in keeping the San Jose scale in check. Mr. Alexander Craw, in his report of the State Board of Horticulture of California for 1891, states that he found it doing such effective work in an orchard in the neighborhood of Los Angeles that complete extermination of the scale was confidently looked for. It was afterwards learned, however, that the orchard became reinfested and also that the partial extermination of the scale in this instance was in a measure seemingly due to a fungus disease."

Dr. J. B. Smith (see P. 516 Anu. Rep. N. J. State Agricultural Experiment Station), says: "It is certain that in California many of the insects die without reproducing. It is certain also the young are not so numerous, and the larvae are not nearly so active as they are in New Jersey, which became more lately infested. In California almost every infested twig showed diseased scales, but the fungus bred from them may not have been the original cause of death. Dr. Howard gives it as Marlatt's observation in Maryland, that the "larvae seem to show a lack of vitality similar to that observed in California."

DISEASE IN FLORIDA.

The condition of the San Jose scale in 1895 and the discovery of the fungus parasite in 1896 have been reported in a former page so I will not repeat it here but will speak of experiments carried out with this fungus and give somewhat in detail the biology of it.

EXPERIMENTS WITH THE DISEASE.

Immediately upon discovering the fungus which was destroying the San Jose scale experiments were begun to learn the length of time it required for dissemination and reproduction. Several branches bearing infested scales were cut from a tree and these cut into sticks about fourteen inches long. Mr. Geo. Mellish carried some home with him and tied them in trees infested with scales. These sticks were tied in such a manner that the rains would wash the spores down upon healthy scales. Six weeks later I visited Mr. Mellish's orchard and found that the disease had taken a good hold on the previously healthy scales.

At the same time material was taken to the laboratory and artificial cultures of the fungus grown. It is not difficult to germinate spores under the microscope and to follow out the reproduction, but the material did not take on the form discovered on the scales. It was therefore necessary to perform further experiments with the laboratory grown spores so as to be certain that it might be used in this manner.

Experiments one to five were located in an orchard belonging to Mr. John Astleford who applied the material. This is a thrifty young orchard located a considerable distance from others. The scales are not severe in it except on individual trees. The insects were spreading rapidly, showing a healthy condition. Mr. Astleford applied the spores to the trees in these experiments:

EXPERIMENT NO. 1.

A small portion (about ½ cubic inch) of bread culture was diluted in a quart of water July 28, 1896. A plum tree severely infested with scale was sprayed on the lower limbs and trunk with this solution in the afternoon and then again after sundown. A portion of the tree was wrapped with a gunny sack to prevent a rapid drying off of the solution.

Result.—On February 20, 1897, the tree was thoroughly inoculated. The disease having spread to many of the smaller

branches and extremities. Showing that it is only necessary to infect a tree and that the fungus will then spread to the further extremities of the tree if scales are present.

Remark.—The idea of wrapping moistened burlap or similar protection about the newly infected portions is well worth following out. These spores germinate in two to three hours and if the atmosphere is dry the germ tube will dry up and death of the spores results while if it is kept moist until the germ tube reaches an insect infection takes place and drouth after that cannot harm the fungus. The data for these facts will be brought out in the discussion of the biology of this fungus. From the foregoing statements it is easily understood why moist weather favors the spreading of this disease.

EXPERIMENT NO. 2.

A peach tree in good condition except that it was severely infested with San Jose scale which were perfectly healthy, was sprinkled, July 28, late in the afternoon with material similar to that used in Experiment No. 1.

Result.—February 20, 1897. Insects not affected. No trace of the disease could be discovered.

EXPERIMENT NO. 3.

A peach tree infested with these scales and otherwise similar to the one used in Experiment No. 2. Sprinkled about the same time with material similar to that used in Experiment No. 1.

Result.—February 20, 1897. Insects all dead.

EXPERIMENT NO. 4.

A peach tree infested with these scales and otherwise similar to the one used in Experiment No. 2, was sprinkled with material similar to that used in Experiment No. 1, on July 28, 1896.

Result.—February 20, 1897. Insects not affected. No trace of the disease could be discovered.

EXPERIMENT NO. 5.

A peach tree a considerable distance from No. 2, severely infested with these scales and otherwise similar to the one used in Experiment No. 2 was sprinkled with material similar to that used in Experiment No. 1. Date, July 28, 1896.

Result.—February 20, 1897. A large proportion of the scales dead and peeling off. The disease well disseminated throughout the tree.

EXPERIMENT NO. 6.

A peach tree in an orchard belonging to Mr. Geo. Mellish, near DeFuniak, was severely infested with these scales and from gnarled appearance one would judge that it had been infested for several years. The trunk and larger limbs were treated with material similar to that used in Experiment No. 1. Date, July 27, 1896.

Result.—February 20, 1897. Tree entirely free from scales.

EXPERIMENT NO. 7.

A tree similar to the one used in Experiment No. 6, except with much lower vitality, was treated July 27, with material similar to that used in Experiment No. 1, and treated like tree in Experiment No. 6.

Result.—February 20, 1897. Tree dead.

Remark.—The death of the tree cannot be attributed to this fungus. Microscopic examinations show that the mycelium does not enter the bark.

EXPERIMENT NO. 8.

A quantity of the material was left with Mr. G. H. Hollowell on July 28, 1896, who applied the material to peach trees infested

with these scales. Considerable dry weather followed the application.

Result.—February 20, 1897. No infection could be discovered.

EXPERIMENT NO. 9.

On July 27, 1896, a peach tree similar to the one used in Experiment No. 6, but infested with gopher scale (Aspidiotus juglans-regae, Coms.) was treated like the tree in experiment No. 6 with material similar to that used in Experiment No. 1.

Result.—February 20, 1897. No infection could be discovered.

EXPERIMENT NO. 10.

On July 27, 1896, a peach tree similar to the one used in Experiment No. 6, but infested with gopher scale (A. juglans-regae) was treated like the tree in Experiment No. 6 with material similar to that used in Experiment No. 1.

Result February 20, 1897. No infection could be discovered.

EXPERIMENT NO. 11.

On July 27, 1896, a peach tree similar to the one used in Experiment No. 6, but infested with the gopher scale, was treated like the tree in Experiment No. 6 with material similar to that used in Experiment No. 1.

Result.—February 20, 1897. No infection could be discovered.

Remark.—In this connection it may be stated that Mr. Mellish tied some sticks bearing diseased San Jose scale on several trees infested with gopher scale (see experiments with the disease on page 102) but not one infection could be discovered. From these results and those of Experiments Nos. 9, 10 and 11, it seems quite certain that this fungus is not a parasite of the gopher scale (A. juglans regae).

GENERAL REMARKS.

1. The success attained by using this fungus from cultures makes it a promising remedy against the San Jose' scale.

2. It is Nature's own remedy and all that we do is to disseminate it properly.

3. It was discovered on a native scale (Aspidiotus obscurus, Coms.) by Mr. A. L. Quaintance, at Lake City. Later it has been found to be very generally distributed both at Lake City and at DeFuniak on these scales (A. obscurus).

4. The fact that it is a native to the State insures a constant source for supply and obviates the use of cultures that might have become attenuated.

5. It is possible that this fungus will not be a practical success in the North and West but will doubtless do well in California.

7. As the scales are killed they wash from the tree leaving the bark and leaves free and clean.

8. It will be noticed that the cooperation of orchardists was secured in making the tests, proving that the laboratory grown material is effective in their hands and that the orchardist who may not be a scientist can apply it properly.

FIGS.

Remarks by C. A. Bacon, W. A. Emmons, Dr. Kerr and W. S. Hart.

[SEE MINUTES PAGES 1 TO 5, ITEM 64.]

Mr. Bacon: I have been requested to bring up the question of figs. They use the fig in a variety of ways. They preserve them; crystalize them in every way and I met a gentleman this winter who is in the business considerably, and he said there was no difficulty in selling all they could raise. Here the fig grows nicely. My experience has been with the yellow figs on the East Coast. The old Spaniards or Minorcans left relics of it there. I have seen a fig on a shell mound, apparently not a particle of earth under it, and doing nicely, and I have seen them in wet places and dry places. So far we prefer the yellow Smyrna. I have several varieties. At the time of the freeze we had two trees. I believe the diameter of the trunks was eight or ten inches; one of them had a spread of twenty feet. We received from those two trees and preserved 400 pint jars. The trees since the freeze have grown eight feet high, and they have figs on them now. I have a Celestial that has come up since the freeze and it shows signs of figs. I have a new introduction by Mr. Reasoner (perhaps he will make a few remarks on that), the "Himalaya." It is a most rapid growing tree. Just previous to the great freeze it grew tremendously; I think in two years it grew twelve feet high, and in December and February it was in full leaf and small figs. But the figs never grew larger than a pea, but that answered my purpose; we had a chance to show figs on the tree in February, but we don't preserve any of the fruit. There is no doubt about the Yellow Smyrna and the Celestial. I have seen the latter growing in places where it was very productive. It has a small fig and will dry on the tree if left. The great difficulty in raising figs in Florida to preserve dry, is, we have the rainy season during the fruiting season, and it has been impossible to dry them in this State in the open air. In California they have the dry season in summer, when the fig is ripening. We have always thought there was money in figs, and to a certain extent we have demonstrated it. We preserve them in four different ways. We preserve in a heavy syrup, sweet pickle them, make fig paste, and put them up in brandy, or in other words, when we talk to a temperance professor, we say "cordial."

Figs are delicious fruit; they will keep for years put up air tight. In regard to the cordial, I would say this is the very nicest thing in the world for a person that is a little off their diet, sometimes called dyspepsia, heart trouble or nervous prostration, or out late at night; take a little fig syrup of the cordial kind, and it will bring you about in nice condition. You can always

take that when you can't take cold water on your stomach.

One thing that should add to the culture of the fig—they are one of the healthiest fruits in the world. Of course you know the proper time to eat a fig; go to the tree, hold up your hand, and when the fig drops, eat it. They are a general antiseptic. You see advertisements of fig syrup—a beautiful woman and a fig hanging by her side, and you go for the fig. But I have been told there is not a particle of fig in the medicine. If you put up the figs yourself, preserve them yourself, you know what you are eating. Figs always come in place. I would say to the ladies, those that are not "up" to it, at your afternoon teas, put a sweet pickled or brandied fig on a delicate dish beside a dish of ice cream, and your friends will all come again.

W. A. Emmons: In West Florida it is the most profitable fruit we have. We have difficulty in the young trees being blown down; after they come up and after they get through one winter, they are all right. I believe I am safe in saying there are trees in my neighborhood that yield five bushels of figs, very delicious.

Dr. Kerr: I believe figs to be a fruit very beneficial but I rise to correct an error made by my friend. He spoke of the different ways of preparing them, but I must make a little objection to his manner of preparing the cordial preparation. He says that it is brandied, and then he goes on as a layman to tell the members of the Society its benefits—and looking around I find a good many troubled with their liver, and they will all imagine right away they will need some of this cordial. Now he has impressed many people with the benefits of this "cordial." Remember it is not the fig that is going to do any good, it is the "cordial" without the fig. There are liquors that when taken into the stomach destroy the pepsin, the active principle of the gastric juices in the stomach, and produce indigestion. I don't want him to get this cordial introduced into the Horticultural Society.

Mr. Hart: As evidence of the vital tenacity of the fig, these trees Mr. Bacon speaks of as having seen on top of the shell mounds at New Smyrna, one was brought here in the year 1765, or about that time by Dr. Turnbull's wife, who was a native of Old Smyrna in Asia Minor, and it has been growing there ever since until last year when a part of the mound was dug down. I have known that tree for twenty-two years, and I never yet have known it fail to give a crop. We have other trees, some very much larger than that, on other mounds, some of immense proportions for fig trees, all healthy. They seem to take especially to the high shell mounds near the salt water. They grow as rapidly on some lower ground where there is no shell.

STRAWBERRIES IN FLORIDA.

As a Market Crop—Cultural Directions and Fertilizer Required—Some Insect Enemies.

Paper prepared and read by B. H. Alden, Zellwood, Florida.

[SEE MINUTES PAGES 1 TO 6, ITEM 69.]

Mr. President, Ladies and Gentlemen: We sometimes hear the remark that a taste has to be cultivated for certain fruits. If there is any fruit of which this is not true I think it is the strawberry. To produce them in Florida, however, in paying quantities for the Northern market, requires cultivation and under somewhat favorable circumstances. The variety is first to be decided, as we must not only have the quantity, and a berry that is pleasing to the eye, but it must also have good carrying qualities. Of the hundreds of varieties advertised at the North, the fingers of a single hand are sufficient on which to count those which have proved a success as shipping berries in Florida. Since being in Florida I have tried over sixty varieties, some being poor growers, some subject to disease, and many their fruit too soft for shipment.

The Noonan Improved thus far seems to be the favorite, and is grown more than any other in Florida for market. The Noonan was introduced here from Charleston, S. C., where it had been grown many years for Northern shipment. A party in Central Florida claims to have grown a seedling from it, which he called the Noonan Improved, and claimed it was much better than the original; but whether one could not be distinguished from the other is questionable.

Strawberries require a large amount of moisture, therefore they are likely to do better on rather low and moist land. For this reason the flat-woods seem to be the favorite land on which to grow them in Fla. The ground is generally plowed into beds of from three to four feet in width on which two rows of plants are set, to beds of twenty-five or thirty feet in width, according to the amount of surface drainage necessary, on which the plants are set twelve inches apart in the row, and the rows twenty inches apart, that being a convenient distance for working with most hand cultivators. In the northern part of the State most of the plants are set in September, although some are set in August. The resetting is continued until a stand is secured. Further south, plants are not usually set until later, as they are more likely to die out from the heat. Some growers make a practice of applying ground bone, potash or some other fertilizer broadcast before the beds are made up. Others open

drills where the rows are to be set, scatter in fertilizer, cover and set plants in two weeks. Other growers use no fertilizer until after the plants are set, and show a little growth, when they open a furrow each side of the rows, scatter in the fertilizer and cover. Some think better results follow where only one side of the row is fertilized at one time, doing the other side a week or two later. If very dry, of course, this does not loosen up so much ground at one time to dry out.

Very often the question is asked: "What is the best fertilizer to use on strawberries in Florida?" I have never seen any person that could answer this without any hesitation or qualification, except a dealer in fertilizers. Almost every grower has his favorite. Many manufacturers make special strawberry fertilizers carrying an extra amount of potash, and which seems necessary, producing a better yield, a better color and sweeter fruit. The amount of fertilizer used to the acre for strawberries in Florida varies from 1,000 to 2,000 pounds, sometimes more, according to the quality of land where used. It is generally put on in three applications, the last time being sowed broadcast and raked in about the time that the plants show signs of bloom, and the mulching put on at once.

Each grower must decide from his own experience as to what kind and the quantity it will pay him best to use. Of this be sure. It does not pay to let plants lag for the want of fertilizer, and they do better forced after cool nights begin, rather than too early in the season.

Shallow cultivation with hand cultivators and hoes produce the best results and is the cheapest method where hill culture is followed, and which seems to be necessary in Florida, as when grown in matted rows the foliage shades the fruit so that it is soft and poor color. Different methods are followed in keeping the plants through the summer; some merely keeping down the larger weeds, others in addition plant corn among them, letting the fodder remain on stalks to shade the plants, and claim that the corn more than pays for the labor. Some do little or nothing to their plants until August or September when they clean them out reset and begin fertilizing and regular cultivation.

Early in the season berries are shipped to the Northern markets almost wholly by open express at a cost of about 6 cents per quart. Later, as the weather becomes warmer, refrigerator boxes are used at a cost of about 12 cents per quart. This includes use of box, cost of ice and transportation. Still later, when the crop becomes too heavy to be handled in that way, comes the refrigerator car, and the cost is 8 cents per quart. In different parts of the State these prices may vary a little, but not much.

It is a very difficult matter to tell what the average yield is per acre through the State, as growers will tell you they get anywhere from nothing to 6,000 quarts. Probably 2,000 quarts to the acre would be a fair estimate. As to the average net profit, it is still more difficult to judge, particularly this year, as the conditions under which they were grown and marketed varied so in different locations. Previous to the freeze it was placed at from $200 to $400 per acre. At and before that time there were few points south of Gainesville from which berries were shipped. Shipments were seldom made in any quantity before February, and unless the fruit struck a blizzard it generally brought fair prices until about April 25th, when Charleston berries were on the market in such quantities that

the Florida grower had to quit. Since the freeze many further south in the State have entered the field as growers and shippers of berries, with the result, under certain circumstances, that the market becomes overstocked and the fruit brings little or nothing. Suppose a frost came sweeping down over the State, killing most of the bloom. Under favorable circumstances we may look for ripe fruit about three weeks after bloom opens. Suppose that after the frost we have three or four weeks of warm weather. The result is, that instead of the the fruit coming on at its natural time, at each point, the State throws its whole crop on the market at one time, and there is a glut. Suppose in addition to this the fruit arrives at its destination in a blizzard. Unfortunately the grower never has been able to make any arrangement with his crate maker, his fertilizer man, his commission man or the transportation company to share this loss, and he has to stand in the gap and pay it all. The others get just as much as though the berries brought 75 cents a quart, except the commission man, and it is generally supposed he "gets there" anyway.

Among the other discouragements that a Florida berry grower has in growing his crop may be rust, grubs, cut-worms, black and white crickets, thrip, etc. Bordeaux mixture seems to be the remedy for rust. Grubs do not like loose ground and for this reason are not usually as bad in new plantations as in old ones where the ground has become packed by travel over it in picking. The cut worm is of varied appearance in color and sometimes he is very numerous. Hand picking is very often resorted to, but the easiest way to fight him is with what is called "bait." With a given quantity of bran, mix enough Paris green to give it a green tinge of color, add enough syrup to merely stick it together, and scatter among the plants. He comes, he eats, he dies.

For black crickets I have never seen anything equal to a flock of ducks and they do not injure the plants or fruit. As some may not know how destructive the white cricket has sometimes been among berry plants in Florida, I will say that a neighbor at one time had two acres of plants entirely destroyed by them, and knowing of no other remedy, dug a broad, deep ditch around that part of his plantation where not so bad, and stopped their advancing farther, for in that instance he came from the East advancing like an army. A spade full of earth taken from that part where so plenty was filled with holes like a piece of honey comb. They are seldom seen in the daytime, coming out only in the night to collect green leaves, etc., to last until the next night. This they carry into their store room from four to eight inches below the surface covering their hole at the surface with a little mound of earth, which is easily found. By pouring two or three spoonfuls of hot water in each hole you cook the white cricket. A large kettle to keep the water hot, an old coffee pot or tea kettle with a spout to it for convenience in pouring is the most convenient outfit for the purpose. If very plenty you may have to go over them two or three times. In some sections the Thrip was very destructive to the berry crop this year. At one point where there were 200 acres of berry plants the loss was estimated at thirty-three per cent. I have a communication on this subject which I will read later.

We often hear of plants running out. This is no doubt largely owing to growers taking their young plants for setting from their old plantations where fruit has rotted

the season before, and in this way getting seedlings. I have found from six to ten around a single old plant. Experts, who make a business of originating new varieties by hybridization, think that if from a bed of several hundred seedlings they get one plant worth propagating, they are doing well. This would show the risk of setting out seedlings from which to grow a crop. Probably the best way to avoid this difficulty is the method practiced at the North. Keep the bloom picked off from a portion of the plantation, allowing no fruit to set, and from these plants get runners for setting. Some growers after their plants are through fruiting, reset the old plants in a new place and from them get new plants. In either case the land should be well fertilized and kept mellow.

Judging from the reports of the strawberry growers of Florida for the past season it has not been a profitable one to them as a class. Of course, there have been individual exceptions and locations, where they have been exempt from insects and frosts, or had an extra large yield of fruit, arriving on the market at a favorable time, bringing a good price and placing their balance on the right side. As for instance one grower wrote me, that from one-half acre he had received almost $500 net. But such instances are the exception. Many have lost heavily. What is the cause, and what the remedy for these conditions? The cause is heavy transportation rates. What do you think of paying $1,000 for the transportation of a car of berries to New York? The Florida berry grower has had to do this. The cost of growing berries in Florida, added to these high rates, puts the cost of the fruit so high when it reaches the Northern market that the masses cannot afford to buy it, paying in addition the profit the grower is entitled to. To show what the grower of Florida has to compete with, for Florida and Louisiana fruit are often in the market at the same time, let us compare the rates from here to Chicago with those from Hammond, La. There berries are packed in crates containing twenty-four pints. Six of these crates are billed at 100 pounds, and the rate is $2 per 100 pounds, or less than $1 per bushel. The Florida grower has to pay 8 cents per quart, $2.56 per bushel, or for a car of 250 bushels $640, while his Louisiana competitor pays less than $250. Unless the transportation companies can in some way be induced, or forced, to lower these excessive high rates I see no remedy but to reduce the acreage.

The following letter was read by Mr. Alden in connection with his paper:

U. S. Department of Agriculture,
Division of Entomology.
Washington, D. C., April 23, 1897.

Dear Sir:—In the absence of the Entomologist, Dr. L. O. Howard, I have to acknowledge the receipt of your letter of the 20th instant.

"Thrip" is a term which applies to a group of insects of small size, not exceeding an eighth of an inch in length and of very simple structure; that is, not fully developed in the matter of wings and other organs. It is a jumping insect and is somewhat allied to the plant bugs or sucking insects. Its mouth parts are in the form of sucking bristles and piercing plates, by means of which it cuts or rasps the tender surface of leaves or parts of flowers and sucks up the plant juices. The result is that where it is very abundant in the blossoms it frequently prevents the young fruit from forming, and sometimes causes the young fruit to fall after it does form. It is

usually black in color, but some species are light colored.

When present in the bloom of plants it is a difficult insect to reach and destroy with any remedies. In such situations it is more or less protected by the parts of the flower, and a wash sufficiently strong to kill the Thrip is also attended with some risk to the plant. The best thing to do is to spray with some mixture like a strong tobacco wash, kerosene emulsion fifteen times diluted, or strong whale oil soap wash. The spray will have to be put on with a spray pump, giving a fine spray to facilitate penetration of the liquid into the parts of the bloom inhabited by the Thrip.

If you have any doubt as to the identification of the insect and will collect specimens and enclose them in a tight tin box and send them to this office under the enclosed frank, we shall be very glad to examine them and inform you positively in the matter.

The accompanying bulletin on insecticides will give you information relative to the washes mentioned, if you are not already familiar with the method of their preparation. Yours truly,

C. L. Marlatt,
Acting Entomologist.

AN ACT FOR THE CONTROL AND EXTIRPATION OF DISEASES AND INSECTS OF AGRICULTURAL PRODUCTS OF THE STATE OF FLORIDA.

With discussion following.

[SEE MINUTES PAGES 1 TO 5, ITEM 66.]

Prof. Rolfs: I will say we have been at work in regard to this report, and the Committee has already sent a draft to the Senate at Tallahassee and the House of Representatives. The bill has been introduced. This was, of course, intended to give the bill the precedence, and get it on the calendar and thus gain valuable time, inasmuch as much work is crowded into the last part of the session. I regret that we have to consider the report this morning, because Mr. Montgomery will probably be here today. We have, I believe, another member of the Committee, who will be absent this afternoon. I have before me the bill, which the Committee has prepared.

Bill as prepared, read by Prof. Rolfs:

"Be it enacted, etc.—

Section I. A permanent Commission to be known as the Florida State Commission for the control of diseases of horticultural and agricultural products is hereby created to consist of the Commissioner of Agriculture, Ex-Officio, the Botanist and Entomologist of the State Experiment Station, Ex-Officio, and one other person who is a Horticulturist, who shall be appointed by the Governor and shall hold his office for a

term of four years, or until his successor is appointed. The Governor shall have power to fill all vacancies that may happen in the Commission, by granting commissions which shall expire when such vacancies are regularly filled.

Sec. II. Said Commission shall meet first within sixty days after approval of this act, and thereafter annually at the seat of government on the first Monday of February, and shall be in session for a period not exceeding ten days; and for such service each Commissioner who is not a salaried officer of the State shall be entitled to be paid four dollars a day for each day's actual attendance at the annual session, and mileage at the rate of five cents a mile for his time and expenses in traveling from the place of his abode to the place of holding the session, and the same rate returning therefrom to the place of his abode, to be computed by the usual route of travel. Each Commissioner who is a salaried officer of the State shall be entitled to his travelling expenses and necessary expenses while attending the meeting of the Commissioners. Said compensation and the necessary expenses of the Commission for stationery, printing and postage shall be paid by the State Treasurer out of any monies in the Treasury, not otherwise appropriated, upon vouchers issued by the Secretary of the Commission and approved by the Chairman.

Sec. III. The Governor shall, when necessary, assign a room at the State Capitol for the use of the Commission in which to hold its annual sessions. Two Commissioners shall constitute a quorum. The Commissioner of Agriculture shall be Chairman of the Commission. The Botanist and Entomologist of the State Experiment Station shall be Chief Inspector, Custodian of the Records, and, when present, Secretary of the Commission. He shall be allowed to secure the services of a scientific assistant and office help for a sum not to exceed eight hundred dollars to be paid by the State Treasurer out of the treasury from monies not otherwise appropriated, upon voucher issued by the Secretary of the Commission and approved by the Chairman.

Sec. IV. Said Commission, or a majority thereof, shall, during its first session, adopt rules and regulations to prevent the introduction and spread of injurious insects and contagious diseases among fruit trees, vegetables, plants, bees or other products grown for profit in the State of Florida, and for prevention, treatment, cure, or extirpation of insect pests, fungus diseases and other maladies of fruit trees, vegetables, bees and other products.

Said rules and regulations may thereafter be modified at any annual meeting of the Commission by a majority thereof.

Sec. V. When at its first session, or at any annual session thereafter, the Commission shall have adopted rules and regulations, or shall have modified one previously adopted, as above provided for, it shall be the duty of the Chairman to have a sufficient number of copies of this Act with such schedule annexed, printed and distributed by mail in the following manner: One copy to each daily and weekly newspaper published within the State; and the schedule so adopted and modified, shall be published in the same manner as the public statutes are published.

Sec. VI. Whenever a petition is presented to the State Commission of Horticulture and Agriculture signed by fifteen or more persons, who shall be resident property owners, fruit or vegetable growers, or

owners of bees, requesting an inspection of any trees, plants or apiary, the Chief Inspector or an assistant inspector designated by the chief inspector, shall proceed to make such examination with the least possible delay and shall enforce the rules of the State Commission applicable to such case or cases. He shall give the owner, lessee or occupier of the property upon which such contagious disease or pest occurs written instructions to use such means as may be necessary to carry out the instructions in the schedule prepared by said Commission for the control or extermination of such disease, fungus or insect pest. If such owner, agent or lessee of property upon which contagious disease, fungus or insect pest is found shall fail to obey the instructions of said expert within the time designated in the written instructions, it shall be the duty of said inspector to employ such service and use such means as may be necessary to control or exterminate such contagious disease, fungus or insect pest.

Sec. VII. Each inspecting officer shall receive for his services $4.00 per diem for each day spent in the discharge of his official duties and necessary travelling expenses.

Such inspecting officer shall make an itemized statement, duly verified by oath or affirmation, of the expenses incurred in inspecting or treating of such diseases, trees, plants or apiary and shall certify the expense of the same to the State Commission of Horticulture and Agriculture. The State Treasurer shall pay such expenses out of the Treasury from monies not otherwise appropriated, upon voucher issued by the Secretary of the Commission and approved by the Chairman.

Any owner, agent, or lessee on whose property shall be found any contagious disease, fungus or insect pest, designated in the schedule prepared by said Commission, shall fail to carry out the requirements of the said Commission, shall be deemed guilty of a misdemeanor and upon conviction by any Court of the State having jurisdiction shall be fined not more than $—— or be imprisoned not more than —— days, at the discretion of the Court.

Sec. VIII. It shall be the duty of every person on their first knowledge of the existence on any tree, shrub or plant, or in any apiary, of any disease, fungus, or insect pest designated in schedule of the Commission, to forthwith give notice of the existence of the same to the State Commission. Any resident owner, agent of non-resident owner, or lessee of any tree, shrub, plant or apiary on or in which such disease occurs who shall fail for the space of ten days from the first knowledge of the aforesaid disease or pest to report the same to the State Commission shall be deemed guilty of a misdemeanor, and upon conviction thereof be punished by a fine not exceeding $——, or imprisoned not to exceed —— days, at the discretion of the Court.

Sec. IX. The importation of noxious diseases and insect pests is hereby declared a misdemeanor. Any person or persons found guilty by any County or other Court in this State, which Court shall have jurisdiction in such cases of importing, knowingly or otherwise, without having taken the proper precautions, into the State of Florida any injurious disease, fungus or insect pest, shall be guilty of a misdemeanor and be punished by a fine not to exceed $500 or by imprisonment not to exceed six months, at the discretion of the Court.

Sec. X. Whenever the Chief Inspector of the State Commission shall know of any

infected trees, shrubs, plants, cuttings, fruit, bees or other material which contain contagious diseases, fungus, or insect pests coming into the State from other States, territories or other countries, he shall at once direct the disposition or destruction of such infected trees, shrubs, plants, cuttings, fruit, or other material as he deems best to protect the interests of the people of the State.

Any or all persons refusing or failing to carry out the orders of the said Inspector shall be deemed guilty of misdemeanors and upon conviction shall be fined not more than $50 or imprisoned not more than thirty days, at the discretion of the Court.

The expenses incurred in carrying out the provisions of this section shall be provided for as in section VII of this Act.

Sec. XI. Any and all injurious diseases, fungus and insect pests are hereby declared to be a public nuisance.

Sec. XII. The wilful resistance to or wrongful interference with any disease inspector or assistant or laborer employed by any disease inspector, while in the performance of any of the duties in this Act prescribed, is hereby declared a misdemeanor, punishable by a fine not exceeding five hundred dollars or imprisonment not exceeding ninety days or both, in the discretion of the said Courts, having jurisdiction of all such offenses.

Sec. XIII. In any case when the destruction or treatment of infected trees, shrubs, plants, or other property of considerable value has been ordered by an inspecting officer, the owner, lessee, or agent of said property shall have the right to appeal to the State Commission and its decision shall be final.

Prof. Webber: It is really not necessary for me to say anything about the report other than that we have had this matter of fungus and insect pest legislation under consideration for several years, and even with this extended consideration it is difficult to arrive at any very satisfactory conclusion. It is for you to make such modifications as you find necessary; of course we expect amendments. We urge upon you to consider the bill until you properly understand it. Legislation of this kind against insects is doubtless needed, but this draft of the bill should be very carefully considered so we may avoid having an obnoxious measure adopted and made a law by the legislature. I think you should consider it carefully section by section, and possibly refer it to the Executive Committee for further consideration. Such a law will probably be passed, and it rests with us to so frame the bill that when made a law it will not be found obnoxious.

Mr. Bacon: I would like to ask Mr. Webber if they have looked over other similar laws; I should say they could get from them the experience of other men and laws on this subject.

Prof. Webber: I would say in answer that Prof. Rolfs and I had under consideration all the laws passed in different States, but the conditions in Florida are different. We do not think it possible to have County Commissioners paid by the State as in California and other states; furthermore, the conditions of the people are different, and all such features must be considered. Suffice it to say that we have had under consideration all the laws of this kind passed in the United States. The Department of Agriculture issued during the past year bulletins containing the text of the public laws relating to the control of insect diseases, fungus diseases, noxious weeds, etc. We have had all of these at our command, and Prof. Rolfs has made it a special point to

correspond with those who drew up the laws now in force in other States, and we have had this correspondence to draw on. The bill it seems to me is about as good as we can frame at the present time.

Mr. Price: I move it be accepted and referred to the Executive Committee for examination, with power to act.

Prof. Rolfs: I will say this bill has embodied in it the bill that was adopted by the Horticultural Society two years ago, the one which our lamented President, Mr. Adams, was mainly instrumental in forming, and the sections have been taken almost bodily from that and placed in this Act. We can claim very little more than using the scissors judiciously. I think the suggestion is an excellent one to refer it to the Executive Committee. We know it will be almost impossible to get through with this if we submit it to the members of the Society, because there are a great many questions to consider, not because there is any great diversity of opinion.

Mr. Bacon: I move that the Executive Committee report back before we adjourn so this could go in to the legislature.

Mr. Gaines: I want to make a suggestion as to the bill, and that is just this: It does not provide a minimum penalty. Under that bill the Court must impose a severe penalty. Without a minimum penalty in that bill it will defeat the bill itself, because the jury and the courts are going to let a fellow off because it imposes such a heavy penalty. I have had some experience in criminal law and I believe I know what I am talking about.

Prof. Rolfs: I think the general statement will call the Executive Committee's attention to it, and they will amend it. I think it is for just that reason we want it to go to the Executive Committee to look after these defects. The Committee appointed to make this report knows nothing about law, and we do not know very much about practical affairs, and if it goes to the Executive Committee they will strike out objectionable features, and I think a general statement of the fact will cause it to look after this point.

Mr. Gaines: I make that merely as a suggestion to the Executive Committee.

Motion to refer to the Executive Committee with power to act carried.

Mr. Hart: I want to say a word in connection with this bill. It is not enough for us to refer it to a Committee and then drop it and cease all effort in its behalf. We as individuals should appeal to our representatives in the legislature to push it, and take every means open to us to forward it. I will call attention to the fact that bees are mentioned in that bill, and that they are to be protected from injurious insects and fungus disease in the same manner as other horticultural and agricultural products are. Many people seem to think that the honey bee is out of our line, that it is not a horticultural subject, but I beg to assure them to the contrary. I have not had time to prepare statistics in connection with this matter, but I have made a few notes, and among them I notice the report of the Committee on Beekeeping Industry and Foul Brood in the United Kingdom. In this report, after giving the value of the annual production of honey and wax in England and Wales, a fine showing for the limited area, the committee goes on to state that "the value of the bees in fertilizing the fruit bloom is greater than for their production of honey and wax."

Twenty times more bees than other in-

sects visit the bloom which is absolutely dependent on insects for pollenation.

The Oregon State Bulletin No. 34, pages 19 to 29, gives experiments in pollenation of fruit trees by bees. Peach trees covered from bees produced no fruit. Full crops were produced where bees had full access to the trees. Much of the fruit dropped at the stoning period where fertilized by hand. I could go on indefinitely giving convincing proofs of their value as part in horticulture, but will let these suffice for the present.

The bee industry in the United States produces a revenue amounting to many millions of dollars annually. Mr. Harbison of California, produced a crop worth $30,000 in one year. Mr. Grimm of Indiana, did the same. His two daughters secured crops worth four or five thousand dollars the same season. There are bees kept all over this State. The industry is in its infancy and it is worth protecting. Within two years the foul brood disease, the most deadly known to bee culture, has developed in this State; the first time we have had any serious disease; it will spread to the woods and will be difficult to eradicate if prompt action is not taken. If this disease is not stopped the industry is doomed, and for that reason I have been trying to draw up a bill giving legal authority to deal with it. The gist of my bill has been incorporated into the bill of this Committee and it goes under its proper head. I would like beekeepers here to urge it. I have petitions from all over the State urging it. In formulating that bill I have corresponded with beekeepers all over this State. In Canada they have such laws, also in California, Wisconsin Michigan, Utah, Colorado and other had correspondence with inspectors who have put them into practical operation, and had the benefit of their advice in formulating this bill. Strong support has been secured for it but it deserves and should have that of each individual present here.

Prof. Rolfs: The reference of this report to the Executive Committee, is that an acceptance of the report and is the Committee discharged?

The President: The resolution is that the report be accepted and the committee discharged. Carried.

FORESTRY.

Remarks as to the importance of the Subject.

[SEE MINUTES PAGES 1 TO 5, ITEM 49.]

Mr. Wright: There is a matter of a good deal of importance to Florida, and I think to America, that has no place on our Standing Committees of this Society, and it is a question of so vast importance that I think there should be a place made for it. That is the question of forestry. There is no Forestry Association in this State, and if there was I do not know as I would be particular to have the matter brought up

by this Association, but in other states where there is no Forestry Association, the Horticultural Societies have generally taken it up. Few of us can realize yet the importance of the subject. If some systematic effort is put forth by thinking, progressive, working men for the replacing of our forests as they are being devastated so rapidly all over the country, and take the warning that has already cursed other nations, we will not be slow to take some action in regard to having our forests replaced to a certain extent every season. We are led to believe that Russia is one of the most despotic governments in the world, yet in this matter of forestry she excells all countries in the world combined in what she is doing in forestry. Fifteen years ago Russia had 1,200 forestry schools supported by the government, while we have not today one. I do not wish to take up the time of this meeting in enlarging on the subject, but as one of the officers of the Forestry Association of this government, I take this pleasure in asking this Association before it adjourns to place it within the hands of the President, or the Executive Committee to appoint a Committee to report one year hence on the question of forestry generally, not only the importance of planting other trees but as to what may be done in tree planting. I, therefore, move that you be instructed with the Executive Committee to place on the next program a Forestry Committee.

Mr. Margary: I fully concur in the remarks of Mr. Wright. As he says, one of our disgraces is the destruction of forests today. We see it in the floods that come upon us; in the blizzards that come down on our fair State caused by the neglect of the care that should be shown to our forests. As we pass over the railroads we see blackened stumps, all the remains of what was once a fair forest. I concur fully that this Society may well take in hand this question.

Motion carried.

FOOT ROT.

Experiences with Foot Rot in different locations.—A number of remedies given by different members. A portion of the general discussion of the citrus after the regular program had been completed.

[SEE MINUTES PAGES 1 TO 5, ITEM 96.]

Mr. Bacon: I got a recipe from F. M. Robinson for the foot rot, one quart of sulphuric acid mixed in twelve quarts of water, spraying under the tree on top of the ground without removing the dirt. The price for a carboy of the acid at Little Bros., Jacksonville, I think is $5.00, with a rebate for return of the carboy.

Mr. Wright: The simplest process for killing foot rot is to expose the root, cut off the loose bark and apply a quart or two of coarse salt; keep the roots exposed, and it

will cure it every time. Don't set your trees so deep but what the collar roots will be above the ground and nineteen times out of twenty you will never have foot rot. The salt will kill the action of the little parasitic worm that causes it, and you have a healthy tree.

Mr. Bacon: Salt is cheap, but simply remove the dirt, scrape off the exudations from the root and lets the roots be exposed to the sun.

Mr. W. A. Cooper: My recipe is simpler yet. Clear the dirt away from the roots, cut away the affected parts and prune it and apply good hot water.

Mr. Hart: I lay the dirt away and expose to the air and leave the dead wood where it is. I have stopped it in sixty trees by simply clearing away the dirt and leaving the roots exposed.

J. A. Icenhour: I have combatted this trouble for nine or ten years, and I find all these remedies act as a check, but I have found no cure. Mr. Phelps or Mr. Hubbard, people who can read the works in French will tell you that the orange growers in those countries have found no cure. People have taken interpreters and gone to the nurserymen on the Italian peninsular and conversed with them; the nurserymen and grove owners of the country take and cultivate the trees, bring them up in the nursery to bearing size and when the trees become affected with this disease they take them out. If these things are absolute cures why, I should say our brothers across the water in the Levant would be benefited by being at this session.

Mr. Taber: I should say I have had the simplest cure of anybody in the house as far as yet demonstrated. I had two trees that were affected and I dug the dirt away from one; it killed the rot on both; I did not do anything to the other one.

Mr. Hart: That is easily understood. The nature of the disease is to appear and disappear, and it may appear again on that tree you speak of. These trees of mine were diseased at least ten years ago, and since that time it has never injured any, except one or two trees in low spots where the dirt washed back in the hole; the others are sound. I heard our Ex-Treasurer, who is a large and successful grower, say he has cured every tree affected that way in his groves by simply exposing the roots. Our experience here may be entirely different from what it is in some foreign countries; what may be a cure here may not be there. In my case it has been effective. I went over this matter of foreign experience with the disease in my citrus report at the meeting of this Society in this town eight years ago.

Mr. Reasoner: Some groves in my neighborhood have been affected seriously; fully one-third in some of them and possibly more; the trees have been so affected they quit bearing. By simply exposing the roots to the air and brushing away the exudation, they are now as perfect as the rest of the grove. I don't know any grove in our neighborhood that has the foot rot now to any extent, and you would not know they ever had had it. They are on high hammock land, well drained.

EXPERIMENTS IN THE ORIGINATION OF NEW VARIETIES OF CITRUS FRUITS, PINEAPPLES AND GUAVAS.

By Walter T. Swingle and Herbert J. Webber, Special Agents of the U. S. Department of Agriculture.

[SEE MINUTES PAGES 1 TO 5, ITEM 81.]

The improvement of citrus fruits in Florida, which has resulted from a quarter of a century of the most careful intensive culture, has been due largely to the discovery of chance variations and possibly part to accidental hybrids. Although the chances of obtaining really superior varieties in this way are slight, seedling oranges have been so extensively cultivated that very many sorts have so arisen. Of the eighty-six varieties of oranges listed by the Catalogue Committee in the Proceedings of the Ninth Annual Meeting of this Society, nineteen have arisen within this State and one other is of American origin, making twenty or about thirty per cent. of New World origin. Taking the most valuable varieties, entered in the catalogue in black face type, we find that of twenty-eight whose origin is known, no fewer than eleven, or almost forty per cent., are of American birth and no less than ten of these originated in Florida alone. The varieties of pomelo listed are all of native origin, as might be expected from the fact that this fruit was first appreciated and grown as a market fruit in Florida alone. On the other hand the lemon and minor fruits to which less attention has been given, are all of foreign origin. The pineapple, which has been grown extensively only for a few years, has not yet given rise to any native varieties worthy of being entered in the catalogue.

Prof. Bailey observes (1) that of the prominent apples probably fully three-fourths are of American origin. Indeed, in Michigan Mr. T. T. Lyon finds of the thirty-eight dessert sorts no less than seven-eighths are of American origin. It is highly probable, as this replacement of foreign varieties by better adapted native ones will continue, that in a short time we shall have native varieties of lemons and pineapples worthy of recognition in the catalogue.

We believe the origination of good new varieties may be greatly hastened by careful selection and by hybridization, and for several years past we have been carrying on extensive experiments along these lines on citrus fruits, pineapples and guavas. We wish to give today an outline of these experiments to the Society.

Hybridization may be said to act in three ways in improving fruits. First, by enabling us to secure any desired intermediate between any two given fruits. This is the effect most commonly sought by the hy-

1. Garden and Forest v. 1892, p. 518. The Sur vival of the Unlike. 1896. p. 311.

bridizer. Second, by enabling us to obtain fruits which in some respects resemble exactly the female parent and in other characters the male. Such are the grape hybrids made by Millardet, which resemble the American parent in resistance to Phyloxera and yet have fruit which retains the exact flavor of the European parent. Third, aside from any blending of the characters of the parent, hybridization may act to increase the variability of the offspring. By making great numbers of crosses there is a chance of obtaining hybrids better than either parent. This is the method followed by the celebrated plant breeder, Luther Burbank, of Santa Rosa, Cal. To secure valuable varieties he grows enormous numbers of hybrids and discards all but the best. For instance, of 40,000 blackberry-raspberry hybrids all but one were rejected. The result of his methods has been astonishing. For example, he bred a hybrid of the Californian and English walnuts which grew twice as fast as the combined growth of both parents.

We have not yet been able to undertake work on such a large scale as this, but hope it can be done before many years, and that not only can better flavored and more productive fruit be secured, but varieties hardier and more resistant to disease.

We would urge upon the orange growers in particular the desirability of crossing the best sorts. The work required is very slight in proportion to the interest and value of the results. The orange is easily crossed and the seedlings are readily grown.

The following lists show what we have accomplished in hybridizing the orange and pineapple during the past four years. In case of crosses made in 1897 it is as yet impossible to give the number of seedlings that will result. Probably on an average one-tenth of the flowers will produce fruit that will ripen, and of the citrus crosses made at Eustis this spring probably half of the fruits now (May) found will hold and ripen.

CITRUS CROSSES MADE IN 1893.

	Trees
Hart's Late with pollen of Tangerine	1
Hart's Late with pollen of St. Michael Blood	9
St. Michael Blood with pollen of Hart's Late	2
Hart's Late with pollen of Mediterranean Sweet	3
Mediterranean Sweet with pollen of Hart's Late	3
Mediterranean Sweet with pollen of Majorca	1
St. Michael Blood with pollen of Majorca	1
Navel with pollen of Majorca	6
Total	26

CITRUS CROSSES MADE IN 1894.

	Trees
St. Michael Blood with pollen of Grape Fruit	15
Parson Navel with pollen of Tomlinson Lime	4
Total	19

CITRUS CROSSES MADE IN 1896.

	Trees.
Sicily Lemon with pollen of Jaffa	6
Dancy Tangerine with pollen of Jaffa	7
Dancy Tangerine with pollen of Mediterranean Sweet	6
Total	19

	Trees
Total of 1893, '94 and '96 crosses	64

CITRUS CROSSES MADE IN 1897.

	Fruits
Lamb Summer with pollen of Bitter Sweet	3
Grape Fruit with pollen of Tangerine	4
Grape Fruit with pollen of Ruby	1
Tangerine with pollen of Grape Fruit	2
Tangerine with pollen of Lamb Summer	1
Tangerine with pollen of Ruby	3
Tangerine with pollen of Trifoliata	2
Ruby with pollen of Grape Fruit	22
Ruby with pollen of Tangerine	8
Ruby with pollen of Bitter Sweet	7
Ruby with pollen of Lime	1
Ruby with pollen of Trifoliata	2
St. Michael Blood with pollen of Grape Fruit	2
Jaffa with pollen of Ruby	1
Washington Navel with pollen of Grape Fruit	2
Sicily Lemon with pollen of Lime	1
Sicily Lemon with pollen of Otaheite	1
Sanford's Mediterranean with pollen of Grape Fruit	3
Sanford's Mediterranean with pollen of Ruby	2
West Indian Lime with pollen of Grape Fruit	4
West Indian Lime with pollen of Trifoliata	3
West Indian Lime with pollen of Lemon	8
West Indian Lime with pollen of Otaheite	1
Trifoliate with pollen of (variety?)	1
(variety?) with pollen of Trifoliate	4
Hart's Late with pollen of Tangerine	3
Mediterranean Sweet with pollen of Hart's Late	4
Mediterranean Sweet with pollen of Tangerine	7
Bitter Sweet with pollen of Hart's Late	1
Sour Orange with pollen of Hart's Late	2
Sour Orange with pollen of Lemon	3
Lemon with pollen of Sour Orange	2
Total (in May)	111

CROSSES MADE AT BRAIDENTOWN, FLA., IN 1897.

(The number of fruits set is not yet known.)

	Flowers
Ruby with pollen of Tangerine	31
Tangerine with pollen of Ruby	33
Tangerine with pollen of Parson Brown	29
Parson Brown with pollen of Tangerine	21
Hart's Late with pollen of Tangerine	19
Tangerine with pollen of Hart's Late	40
Mediterranean Sweet with pollen of Tangerine	27
Tangerine with pollen of Mediterranean Sweet	12
Navel with pollen of Ruby	38
Satsuma with pollen of Parson Brown	21
Total	271

PINEAPPLE CROSS MADE IN 1896.

	Plant
Mauritius with pollen of Red Spanish	1

PINEAPPLE CROSSES MADE IN 1897.

	Flowers
Abbaka with pollen of Porto Rico	84
Abbaka with pollen of Giant Kew	7
Abbaka with pollen of Smooth Cayenne	31
Abbaka with pollen of Pernambuco	22
Porto Rico with pollen of Smooth Cayenne	65
Giant Kew with pollen of Pernambuco	4
Giant Kew with pollen of Porto Rico	11
Pernambuco with pollen of Smooth Cayenne	11
Pernambuco with pollen of Porto Rico	7
Pernambuco with pollen of Giant Kew	11
Enville City with pollen of Pernambuco	18
Enville City with pollen of Smooth Cayenne	26
Enville City with pollen of Porto Rico	41

Green Ripley with pollen of Smooth Cayenne	71
Red Ripley with pollen of Smooth Cayenne	30
Black Jamaica with pollen of Smooth Cayenne	4
Queen with pollen of Smooth Cayenne	83
Cayenne	4
Juno with pollen of Smooth Cayenne	38
Jamaica Red Spanish with pollen of White Antigua	7
Jamaica Red Spanish with pollen of Red Cayenne	38
Sugar Loaf with pollen of Smooth Cayenne	35
Yellow Ceylon with pollen of Pernambuco	3
Blood Ceylon with pollen of Porto Rico	9
Mauritius with pollen of Smooth Cayenne	36
Total	693

GUAVA EXPERIMENTS.

In the case of the guava, where no special attention has been given to the differentiation and development of varieties, there is a great chance for improvement in almost every direction. Color, flavor, odor and number of seeds all need to be speedily considered and improved by selection and hybridization. The color of the rind is now commonly yellow or yellowish green and unattractive. In some cases a red blush may be observed on the cheek, and by careful selection this character could be augmented. In like manner the flavor and odor differ greatly in various plants, and these characters could be greatly improved by careful selection. At present all varieties of the guava cultivated in Florida are very seedy. It is of the highest importance that the number of seeds be greatly reduced if the fruit is to gain in popularity. The guava makes an excellent evaporated fruit, and if the seeds were reduced to a small core, so that the fruits could be cored and sliced by machinery, evaporated guavas would probably become a staple article. As the reduction of the number of seeds is of the greatest importance, our attention has been directed thus far to this feature.

It is very important in starting breeding experiments of this sort that plants be selected which have shown a decided tendency to vary in the desired direction. Consequently a careful search was made last fall (1896) in several parts of the State to select plants bearing fruits with exceptionally thick exocarps and few seeds. As a result of this search four were selected for breeding: (1) a sort ripening very early with golden yellow exocarp and pink endocarp; (2) a very large pear-shaped variety with pink exocarp and endocarp; (3) a round fruit with golden yellow exocarp and pink endocarp; (4) a round sort with blood red exocarp and endocarp. The seeds from these were planted and the young plants, of which there are some 328, have now reached a height of six or eight inches. It is planned to grow a considerable number of seedlings from each of the four lots, and when they fruit to carefully select the plants of each kind which produce fruit with the fewest seeds. Seeds from these bushes of the second selection will be planted and fruited, and from these a third selection will be made. By continuing this process for several generations the writers feel confident that a seedless guava, or one having but very few seeds, can be developed.

SUMMARY.

	Seedlings
Citrus hybrids secured in 1893	26
Citrus hybrids secured in 1894	19
Citrus hybrids secured in 1896	19

Fruits

Citrus crosses made in 1897 (Eustis, Fla.) in May.. 112

Flowers

Citrus crosses made in 1897 (Braidentown, Fla.).. 271

Pineapple crosses made in 1896, 1 apple, 1 plant.

Pineapple crosses made in 1897, 56 apples, 693 flowers.

Guava seedlings for selection experiments (in 1896).. 328

GUAVAS.

Discussion following reading of paper on "Experiments in the Origination of New Varieties of Citrus Fruits, Pineapples and Guavas."

[SEE MINUTES PAGES 1 TO 5, ITEM 82.]

Mr. Hart: I would like to ask the Professor if any search has been made for seedless guavas outside of the United States?

Prof. Webber: I have heard of a seedless guava, but in an indefinite way; all reports that come to me from other countries have been so indefinite I have been unable to follow them up. I have been unable to learn of any seedless guava growing in any country.

Mr. Hart: I had a friend and a neighbor who was in Cuba two years. At the time he left there, one of his neighbors went fourteen miles to get a particular kind of guava, which was especially fine and seedless, for him to bring to Florida. He planted one of the seeds and I think only two plants survived. Whether those passed through the vicissitudes of the cold of 94-95 I cannot say. But I am convinced from the report of this gentleman, who is a careful observer, that there is a guava in Cuba which is very much superior to the one we have here in cultivation at present.

A Member: How could he plant the seeds if they were seedless?

Mr. Hart: There are none absolutely without seeds, but I give the term as usually used, and as every horticulturist understands it.

Mr. Geo. I. Russell: I am very glad to know that Prof. Webber is trying to find a seedless guava. The majority of the guavas have something like 400 seeds. The gentleman that made fun over the fact that fifteen or twenty seeds were found in a guava, must remember that that is a very small number of seeds for a guava to have. The fact that there were so few is a great encouragement to search for a seedless guava. I have come in contact with guavas that had as few as ten seeds, but it was only once in a great while; the majority have something like 400, and I have had them pan out more than that. If we could find a seedless guava they could be evaporated and put out in a shape that would make a great industry for Florida, and I hope to see the day when we shall have such fruit.

VEGETABLE GROWING AND TRANSPORTATION.

Remarks by Hon. Mahlon Gore, of Orlando, Fla., Chairman of Standing Committee on Vegetables; with discussion following.

[SEE MINUTES PAGES 1 TO 5, ITEM 93.]

[The remarks by Mr. Gore led to references to the question of transportation and it has seemed best to the Secretary to place all the remarks under one head, as they all have a marked bearing on the question of profitable vegetable growing in Florida.]

Mr. Gore: I have prepared no paper for the reason as I wrote you a few days ago that I hardly expected to be present at this meeting, and relied on my associates on the Committee to present a report, but it seems none of them are here, and consequently we have no report. I will say, however, that in my own judgment, from my observation, the production of vegetables is perceptibly falling off in this county, and particularly in this immediate vicinity during the last two years, with a probability of a still further decline in production, unless some change occurs that will make it to the advantage of the grower to plant largely and cultivate on a more extensive scale. Outside of the production of what we need for our own home use very little is being done in this immediate vicinity.

In some parts of the county, notably in the South Apopka region, vegetable farming is carried on extensively and profitably and those people are meeting with good success. They have some advantage over us, first, in the matter of water protection and situation, being on the south side of a large lake, and, second, in the matter of soil, as they cultivate largely in hammock land. They are getting along well; their operations are attended with success, and they have been engaged in it long enough so that they have acquired a knowledge and skill in packing and shipping, which enables them to get very good returns during the early part of the season while prices are high in the North. Later on in the season, while a large part of the crop remains in the field, prices drop off in the North and the rates of transportation being practically prohibitory, a large percentage of the crop remains on the ground, and is never harvested. If they could get even a very small net price for them to pay for harvesting, it would add very materially to their income, but that seems impossible under existing conditions of things. What is true of this county is probably true of every other county in the State. Here and there an individual is successful in general farming and in the production of vegetables, and here and there a section where there seems to have been an aggregation of practical farmers, who have engaged in the business.

Mr. Bacon: What are the conditions at present that must be changed in order to

make vegetable growing profitable in Florida.

Mr. Gore: That question leads back to the foundation of this problem. If I were to answer your question honestly and tell you exactly what I believe, I would go to the bottom of this thing, back to the men who came to Florida as compared with the men who have gone in the West and made that country what it is through agriculture. Through the policy of the transportation companies and land companies in the West in inducing the right kind of men to come in. I believe every man will bear me out in the claim, that the young men in Florida, the young members of this Association who are practical men, are the successful men tday. Old men, whose hairs are turning gray, or who come here as invalids, and the men who have followed some other calling than agriculture in the North, become fascinated with Florida and engage in a business for which previous experience has in no sense equipped or qualified them; men, who on the best farm in the United States would starve to death by reason of lack of experience and adaptability. Why the transportation companies and the land companies having vast interests should induce those old men to come here to engage in agriculture to the neglect of young and practical men, I cannot understand. I was raised in the West and much of my life has been spent in advance of the railroads. The men who came out there were young men from the farms of the Eastern or Middle States, who desired to get away from the old homestead and secure homes for themselves and make their living out of the land. When the transportation lines reached us they brought us thousands of men, hardly one of whom had reached 40 years of age, and many were less than 25, with a determination to take hold of this land and succeed on it by agriculture.

Go into the cars of the transportation lines in Florida during the busy season here, and what do you find? Three men out of four are white headed, and the odd man has but one lung. He is coming here for his health.

Less than three years ago, I called on a man about three or four miles in a southeast direction from Orlando, stopped at his gate to talk with him as I was passing. He was a stranger and a new comer, and in conversation he complained that the rabbits were eating his vegetables. He had wire netting fences about three feet high, and he asked me if the rabbits could jump over his fence. They were eating off his vegetables as fast as they came. I went inside with him and looked over the ground, and picked up a little stick about the size of my pencil, and went to the stump of one of those plants which had been cut off, dug into the ground and fished out a cut worm. "Well," he says, "I didn't understand it; I supposed it was rabbits." He says, "I am about 65 years of age, and have spent forty-five years of my life in a dry goods store; I never plowed a furrow in my life until a few weeks ago." And yet this man with his lamentable dearth of knowledge of practical agriculture is a fair representative of a large class of men who are engaged in farming in Florida. It is no wonder that failures are so frequent.

If you can give us young men of practical experience who understand farming from practical knowledge, men who would succeed if on a farm in the North, we will soon hear of more instances of success and fewer of failure. Florida, with the opportunities she offers of raising two general

crops per year on the same land, opens up an unrivalled field for such men.

I don't know how I can answer your question better than I have. Put into your own county one thousand men not to exceed 25 years of age, and with not to exceed $500 each in their pockets, with no prospect or hope before them of making a living in any other way than to take that land and make a living out of it, and what would be the result? They would revolutionize Volusia county in one year's time. They grasp an idea better than a man who has reached fifty; they catch on quicker, they adapt themselves to new conditions more readily.

Mr. Bacon: We have a good witness here and I am loath to let him go. We know Mr. Gore is a newspaper man, and we give him credit for touching on a vital point very generally, but he came very near answering the question as I wanted him to do. If you had those thousand men he spoke of, and they produced the income in vegetables he intimated, is there not one reason at the present time why those young men would not succeed? Is there not another difficulty; don't the railroad companies at the present time seem determined to kill the goose that lays the golden egg?

Mr Gaines: I agree with Mr. Gore—we want young men; we want hustlers, those are the men who will grow stuff. But no state in the Union or any other country will yield so generously as Florida soil. The trouble is not in the ability to grow the stuff, the trouble is that we grow it. Just tickle the soil a little bit and it yields. The trouble is not in growing, it is to get rid of it after you grow it. We want men who are hustlers, business men, not so much on the farm as in the offices of the transportation companies. There is where we want business men, who have good sense enough to encourage agricultural productions instead of doing everything possible to discourage the grower. In other words, I believe this State has been as generous with the railroad companies, transportation companies as any state in the Union, and yet in no state do they treat the grower as outrageously as they do in this State; in other words, the question of transportation is not what it costs them to take to market, but just how much they can squeeze out of it. I say the railroads stand in their own light. Better carry ten million crates of vegetables at 10 cents a crate, than carry one million at 15 cents. The trouble is not in producing stuff, but getting it to market. I say Mr. Gore is right, we want young men, but we want them in the railroad offices.

Mr. Wright: I am glad Judge Gaines has sprung that part of the question. If we had one thousand young men, we would want some of them in the Legislature, and we want some of them possibly in the railroad committee; we would want to get them in the places of some of the men, who are now there, not for the reason they are better fitted to go there, but simply because they stand in with young men. This problem I have been through before I ever came here. It is the same talk I have heard in Iowa and in Dakota, and in my western experience we were anxious to get railroads built, and we cursed them for extortions after we got them. History repeats itself. If you produce a product in sufficient quantity to invite competition you will get the railroad transportation that you want. Get young men here who have got fighting blood in their veins. We old men have done our life work; we have fought the battle, and the young men coming on

must make that fight. Give us young men and the whole question will solve itself; it is an old question in the West. With the granger men in the State of Florida to take hold of the movement, they will regulate it to the advantage of the farmer and the successful solving of the whole question. But we cannot do it unless there is the fighting material here. We want young blood and we want lots of it.

Under the rules of the Society this question of transportation is a tabooed one. We have no right to discuss it here. I now give notice, Mr. President, that I shall ask at our next annual meeting to have that rule abrogated. I hope the Secretary will make a note of that so that there will be no question raised a year hence.

I wish now, while I recognize I am practically out of order, that you will permit me to say a few words in extension of what has already been said on this question. As my friend Carey said, I was all through this transportation question in Iowa. It was a very simple question. First, can Florida produce something that is wanted in the North that the people are willing to exchange their money for; second, can the transportation companies carry the product of Florida and handle it in such a manner as will reach New York and other large cities in good condition that it will repay the shipper?

I saw that question very practically illustrated in Iowa one time. I wish just to make the impression of its meaning by relating the fact: At one time in Iowa there was a large crop of corn, and in fact the whole Northwest. The merchants along the railroads in the corn belt are in the habit of buying up corn and putting it in large cribs; they exchange their goods for corn and hold it and ship it to Chicago when they can get their money out of it. One time the President of the Chicago & Rock Island railroad went over his line crossing the State of Iowa, and saw at every point he came to every corn crib was full of corn and every side track was full of empty cars. When he got back to Chicago he called his General Traffic Manager in the office, and asked an explanation of this state of things; but the manager made the statement, he could not understand it. He says, you make it your business to find out; go over the line and find out. He did so. He found in every point he went to just about like this: Our corn costs us so much money; it costs us under the present rates so much to put it in Chicago market; it is worth in Chicago market about so much, a certain number of cents less than the cost to put it there. We can afford to hold our corn. What do you want? We want lower freights. We need the money; we are indebted to the Chicago merchants, but we are not going to lose our capital by putting our money in your pocket. If you will give us freights low enough so we can move our corn and let us get out whole, we will move it. The General Traffic Manager went back and reported to his President. The President replied, make those rates. And inside of four days there was from four to ten train loads going over that road loaded with corn for Chicago.

Now that will apply here. Produce a good article. Few men in Florida yet have learned to produce a good article. Produce what will bring the highest price. Just as well produce a good tomato or a good cucumber as produce a second class. After you produce it, put it up in such a manner that it will command the highest price when it reaches the market. Then you im-

press upon the transportation companies the importance of meeting the producer half way; whenever that is done Florida will be the pivotal State of the South in producing the stuff for the North, and we will have the ducats here to educate our families as they should be. These are facts worth consideration.

MARKETING FRUIT.

Remarks by Valentine F. E. Taylor, Avon Park, Florida.

Mr. President and Members of the State Horticultural Society:

I cannot do better than take the present opportunity of delivering to the Fruit Growers of this State, a few words regarding the packing of all varieties of fruit for shipment to, and sale in the market of the eastern and western portions of the northern states, addressed to me by one of the largest firms of Fruit Auctioneers in New York while I was in that city early last year.

Of the vast quantity of fruit reaching New York every year only a relatively small proportion of the total arrives in that city in fine condition as regards first, the state of the fruit itself; secondly, grading and packing, and thirdly the appearance of the package.

To aid in making my words clear and brief let us take the questions as they come; first the state of the fruit; it is of the greatest importance that in preparing our products for a distant market that we should select fruit that is perfectly sound, because nothing so seriously lessens the value of a package than the presence of unsound fruit.

Secondly; great care should be given to the grading and packing. If you have three grades, either regarding quality or size; pack these grades separately. Next to importance to the soundness of the fruit is that each size should be packed separately.

Thirdly: It is always best that the fruit should be packed in as neat packages as possible for it is a great factor in selling it to the best advantage.

If any person in shipping has we will say ten packages of prime fruit and one of fair quality, he should so pack them. If he hopes to improve the quality of the fair package by mixing it with the ten prime packages he will make a mistake and why? When the shipment reaches the northern market and the sample is drawn, buyers will see some fruit of an inferior grade and suppose the whole mark will contain similar fruit and he will only pay for the whole mark at the price of the fair fruit.

Many growers split their shipments up among several sellers greatly to their disadvantage because by so doing they do not reach the big buyers who pay full market prices for what they want. The large buyers who want large quantities of fruit go to the large commission men to supply their wants having neither the time nor the disposition to buy ten packages here and ten elsewhere, but go where they can buy ten or ten thousand packages. If in buying he finds the fruit will carry to any inland point without repacking he is willing to pay from 25 to 50 cents extra a package.

We hear of fabulous prices being realized for fruit in the big northern markets and it is really so for when there is such a demand

Citrus Experiment Station
Lake Alfred, Florida

for good fruit they are willing to pay any price for it. I have seen oranges sell for $9.00 a barrel, and prime grape fruit for $32.50 and sell at these prices week after week.

If we take every care to have our produce reach a market in perfectly sound and attractive packages we shall not cry out about poor returns if we consign our produce to a reliable house.

PLACE OF NEXT MEETING.

Immediately following the election of officers, the selection of the place in which the next annual meeting of the Society was to be held was brought up by Mr. E. O. Painter.

Mr. Painter: As there is no provision made in our program of the time for considering the question of the place of meeting, I move that it be the first order of business tomorrow night.

This was amended that it be considered at 10 o'clock tomorrow morning.

A Member: I offer a substitute, that the matter be considered now. Motion carried.

Mr. Robinson, of Sanford: I received a telegram from the Board of Trade of Sanford, which reads as follows:

"Motion passed by the Board of Trade that you invite the State Horticultural Society to meet at Sanford next year."

(Signed) President Board of Trade of Sanford.

The following letter was read from the Board of Trade of DeLand:

DeLand, Fla., May 3, 1897.

To the Officers and Members of the Horticultural Society of the State of Florida:

The Board of Trade of the City of DeLand hereby extends to the Horticultural Society of the State of Florida a most cordial invitation to hold their next annual meeting in this city, and promise that if this invitation is accepted every effort will be made to make the meeting profitable and the visit pleasant to all who may be able to attend.

Trusting that this invitation will meet with your favorable consideration and that we may have the pleasure and honor of having your next meeting at our home, we are, Very respectfully yours,

(signed) M. Davis, President.
Silas B. Wright, Secretary.

An invitation was extended by Mr. Wilson on behalf of the Gate City of the State (Jacksonville).

An invitation was extended on behalf of the City of Orlando by Mr. O'Neal, Mr. Gore and Mr. Palmer.

On motion an informal ballot was taken and Orlando and DeLand received the highest number of votes, receiving respectively, Orlando 56, DeLand 24.

On motion Orlando was selected as the next place of meeting of the Society.

ELECTION OF OFFICERS.

[SEE MINUTES PAGES 1 TO 5, ITEMS 44, 45, 46 AND 46.]

The following members were appointed tellers: Messrs. Price, Reed and Painter.

Mr. Cameron: I move the members be required to show their badges to the tellers before voting. Motion carried.

Mr. Price: In order to facilitate business, I think it eminently proper and would offer a resolution, that the Secretary be instructed to cast the vote of all the members for G. L. Taber for President. Motion carried.

Mr. Taber: I assure you that I appreciate this recognition on your part, which I, however, do not feel that I deserve. I am well aware that there are others among our members, who could fill the position better than I, those who have had more practice, and perhaps are otherwise better qualified. I assure you, however, that I will do the best I can, but I fear I can never hope to make as good a President as my illustrious predecessor. Again I thank you most kindly.

The following were elected for Vice-Presidents, being the only nominees for the respective offices:

First Vice-President, Dr. E. E. Pratt, of Limona.

Second Vice-President, C. A. Bacon, of Ormond.

Third Vice-President, John B. Price, of Eustis.

Mr. H. G. Hastings, of Interlachen, was nominated and elected for Secretary.

Mr. W. S. Hart, of Hawks Park, was nominated and elected for Treasurer.

The following members were elected to constitute the Executive Committee:

Lyman Phelps, Chairman, E. S. Hubbard, F. G. Sampson.

Mr. Bacon: I move that the resignation of Mr. A. H. Manville be accepted as Secretary. Motion carried.

Mr. Bacon: I move that the new Secretary's duties begin at this time, to fill out to the 1st of January the remainder of the term of Mr. Manville. Motion carried.

Mr. Hart: I did not know that the matter of the resignation of the Secretary was coming up at this time, or I should have been prepared to offer resolutions whereby this Society might fittingly acknowledge the value of the work performed by the retiring Secretary while holding that office for the past three years. Mr. Manville's services have been of too much value to this Society to pass over them without some special recognition by this Society of its appreciation of them. I would be glad if some resolutions of that kind were prepared, or some Committee appointed to draw them up, or the Secretary instructed to make special mention of them in the printed report. Mr. Manville has labored long and faithfully for this Association, and I for one would not be satisfied to have it passed over without further comment.

Mr. Bacon: I move that the Committee on Final Resolutions be instructed to report suitable resolutions recognizing Mr. Manville's services. Motion carried.

NECROLOGY.

Report Submitted by Dr. E. E Pratt, J Willis Westlake and Geo H Wright; together with eulogistic remarks following the report.

[SEE MINUTES PAGES 1 TO 5, ITEMS 75, 76, 77, 78 AND 79.]

Mr. President: Seldom is a society so afflicted as the Florida Horticultural Society has been during the past year. It has lost its executive officer, who has presided with great dignity and ability over all its deliberations from the beginning of its existence, and who may appropriately be called the Father of the Society; it has lost an eminent and efficient member of the Executive Committee, a man of high character and ability and honored in every walk of life; and it has lost besides these, four of its most useful and efficient members, who were ever ready to do whatever lay in their power to advance its interests.

The sad death roll in chronological order is as follows:

Charles Francis Adams Bielby, of DeLand, Volusia County, died in Jacksonville July 8, 1896, aged 48 years.

William Henry Wardwell, of Plymouth, Orange County, died in Brookline Mass., September 10, 1896, aged 77 years.

Orlando P. Rooks, of Fruitland Park, Lake County, died November 12, 1896, aged 57 years.

Abner Griffith, of Ocala, Marion County, died at Ocala December 17, 1896, aged 41 years.

Mrs. Mary Lyman Phelps, wife of Rev. Lyman Phelps, died at Sanford, January 24, 1897, aged 57 years.

Dudley Whitney Adams, of Tangerine, Orange County, died at Tangerine, February 13, 1897, aged 65 years.

It is with profound feeling of sadness that your Committee on Necrology, to whom the painful duty was assigned by your honorable body, beg leave to report the following resolutions:

Whereas, death has again invaded our Society, and taken from us since our last annual meeting, several of our most useful and honored officers and members, and

Whereas it is fit and proper to honor their worth by putting on record our appreciation of their services and character, and our sense of the great loss that our Society has sustained by their death; therefore,

Resolved, That in the death of Dudley W. Adams, the Society has lost a President of rare executive ability, a man of high character, earnestly and officially devoted to the highest interests of the Society and the State, and a valued friend and associate. In the death of Hon. C. F. A. Bielby we have lost a very efficient officer and member, an honored Christian gentleman, and a valued friend; and that in the death of

William Wardwell, Orlando P. Rooks, Abner Griffith and Mrs. Mary L. Phelps, we have been deprived of the services and assistance of some of our most useful members, who were ever ready to do whatever duty lay before them as members and citizens.

Resolved, That we extend our sympathy to the immediate families and friends of our deceased associates.

Resolved, That these resolutions be spread upon the minutes of the Society, and that a suitable memorial notice of each of the deceased officers and members named above, be printed in the official reports of the proceedings of this meeting.

Orlando, Fla., May 6, 1897.

Dudley W. Adams.

Dudley W. Adams was born in Winchendon, Mass., in 1831. His father died when he was four years old. His mother however, gave him a careful home training, and an ordinary district schooling, with the addition of an academic course which he assisted to secure, by intervals of teaching. At the attainment of his majority he went west, and became one of the first settlers of Waukon, the county seat of Allamakee county, Iowa, and long occupied a position of prominence in the public affairs of both city and county.

From 1853 the growth of the community was rapid, and Mr. Adams proved to be a most valuable acquisition to the pioneer settlement. His services as surveyor were sought far and wide, and two years later he was made assessor, continuing to serve in that capacity about ten years. In 1854 he was also chosen president of the County Agricultural Society, which was organized at that time. In 1856 he entered in the work of horticulture in which he always found great pleasure, and in after years the "Iron Clad Nursery" of Waukon became famous where others failed, and in 1871 at an exhibition of the State Horticultural Society, of which he was for five years the secretary, he took the sweepstake prize with one hundred varieties, for the best and largest display of apples. Again at the State Fair in 1879 he took the sweepstakes with 172 varieties of apples.

Together with his neighbors in 1869 Mr. Adams effected the organization of the Waukon Grange, Patrons of Husbandry, the third in the State. He discharged the duties of Master, Overseer, Lecturer and Secretary of the Grange at various times, and upon the perfection of a State organization in 1872 he was elected Master for a term of two years. In 1873 he was made Master of the National Grange, whereupon he tendered his resignation to the State Grange, then comprising over 10,000 members, representing 800 subordinate granges which he had organized, a fact which serves to illustrate the energy and zeal of the man who was called upon to preside over the National body. At that time there were only about 1,200 subordinate granges in the United States, but at the expiration of his term of three years, there were nearly 22,000 granges spread over nearly all the States and Territories.

He came to Florida in December 1875 and engaged in his favorite pursuit of horticulture in his winter home by setting out a small grove of orange trees, which has since grown to about 37 acres in size.

Mr. Adams was a close observer and a man of remarkable research. Everything that came to his notice was immediately put to the test of figures, rule or reason,

and knowledge gained or conclusions arrived at stored away for future use.

This brief history of Mr. Adams shows the character and ability of the man who in 1888, with a few friends, met at Ocala and organized the Florida State Horticultural Society. Mr. Adams was chosen President, which office he held—with honor to himself—by the unanimous wish of the Society, from that time until his death. He was exceedingly solicitous for the welfare of the Society, and always earnest in his efforts for its best interests and advancement. In the nine years he was with us he saw the Society grow from the small beginning to a membership of 300, and constantly increasing in its influence and usefulness. What it has attained and accomplished is due in a large measure to his wisely directed efforts and thoughtful care. The Society will mourn his death as long as his genial presence and characteristics are remembered. His influence and example have been of untold benefit to the people of this State, and his death while still in the full vigor of mature manhood, is a State calamity.

C. F. A. Bielby.

Charles Francis Adams Bielby was born in Little Falls, N. Y., in 1848. After due preparation he entered the ministry of the Protestant Episcopal Church in 1872 under Bishop Deane. He served as Rector for five years in Ilion N. Y., and afterwards for six years in Buffalo. In 1883 he resigned his parish and came to Florida, making DeLand, Volusia County, his home, and engaging in orange culture. He interested himself actively in all matters pertaining to horticulture, and endeavored to benefit all those engaged in it. He connected himself with the Fruit Exchange, of which he was made a Director, and finally Vice-President. He was one of the founders and most diligent promoters of the State Horticultural Society, and was for some years an efficient member of the Executive Committee. He was also for some years a most useful member of the Board of Trustees of the Florida Agricultural College, serving as such at the time of his death. In 1886 he was elected to represent his county in the Legislature, and in 1888 was elected to the State Senate. In 1891 he was appointed by President Harrison National Commissioner of the World's Columbian Exposition. In all these offices of public trust he was conspicuous for his broad-minded, liberal and conservative policy, not laboring to advance any selfish ends, but ever actuated by a lofty idea of the trust imposed upon him. For some years before his death he served as rector of the church at DeLand, his home church. He died of Bright's disease, July 8, 1896, sincerely and deeply mourned, not only by immediate friends and neighbors, but by all who knew him.

"None knew him but to love him
None named him but to praise."

Abner Griffith.

Abner Griffith was born in Ebensburg, Penn., on October 5, 1855. He first came to Florida in 1880 when he purchased a small tract of eighty acres of land south of Ocala, upon which he built a comfortable home and improved after New England style one of the neatest little farms in Marion County. Mr. Griffith spent his winters in Florida giving his time and attention to farming and fruit growing, of which he made a marked success. While at his home in Ebensburg, Penn., he was largely interested in the lumber and oil

business. He was universally loved by all who knew him and was regarded as an exemplary Christian gentleman.

Orlando P. Rooks.

Orlando P. Rooks was born in Potter County, Pa., October 9, 1839. Served his country in the Civil War, where he received his title of Major, and came to Florida in 1876 from Indianapolis, Ind.

At this time he had been suffering from weak lungs, caused by continued attacks of pneumonia, and came here for the purpose of deriving the benefit from the health-giving properties of Florida's unequalled climate.

In a short time he recovered his health and strength, a fact which contributed largely to his well known enthusiasm for Florida.

He selected a location about three miles north of Leesburg, where he made his home, and which at once with his proverbial energy and perseverance he commenced to improve and develop. He drew others around him, and through his efforts "Fruitland Park," the name he had given his location, soon became a beautiful place and "a charming community of cultivated people."

He was very fond of flowers and successful in their culture, and also one of the foremost pomologists in the State, growing a great variety of citrus and other fruits, and being a recognized authority in horticultural lines.

He was among the first members of the Horticultural Society, entering heartily into its organization, and ever ready with his untiring zeal to promote its interests and efficiency.

His efforts and experience in his favorite pursuit, coupled with his prominence and indefatigable labors in all organizations for the welfare of the fruit growers, made him preeminently a benefactor to the best interests and prosperity of South Florida, and in his death, not only the Horticultural Society, but the whole State, suffers an irreparable loss.

Major Rooks was a valuable citizen, a kind friend and neighbor, and a devoted and loving husband and father. He leaves a widow and two sons to mourn his decease and words fail to express the poignant grief for the vacant place in his home and immediate neighborhood.

William H. Wardwell.

William H. Wardwell was born in Lyndeborough, N. H., October 24, 1818. After engaging in the book trade and printing at Anderson, Mass., he removed to Boston and was associated with J. P. Jewett & Co., and later with Grant, Warren & Co., out of which grew the firm of S. D. Warren & Co., with which his connection continued nearly forty years.

In these relations he was highly esteemed for strict integrity and careful attention to business.

He came to Florida in 1885 and the last few years was greatly interested in the growth of fruits, having a fine orange grove in Plymouth, Orange County, known as the "Pine Ridge Grove."

He was a valued member of the Horticultural Society for several years.

Mrs. Mary L. Phelps.

Mrs. Mary L. Phelps wife of Rev. Lyman Phelps, was born in Goshen, Conn., August 15, 1839, and came to Florida in 1872.

A woman of rare excellence and loved by all who knew her, we cannot give her a

more fitting tribute than to copy an extract from her obituary.

"It seems but justice to the memory of a good and noble woman to speak more fully than we could last week, of the loss which all who knew her have sustained in the death of Mrs. Phelps. Yet this is difficult since her modesty and entire freedom from egotism, would cause her to deprecate all eulogy of herself. Though fitted, both by nature and birth to adorn society, she was essentially a home-maker.

With rare unselfishness and cheerful self-abnegation her quick intelligence and great executive ability were devoted to what some might call the "narrow sphere of home." This she made the "dearest spot on earth" to her husband, son and the aged mother whose winters were passed with her, and a delightful resting place for every friend who came within its hospitable walls.

Her ready sympathy went out to those less favored than herself, and many are the sorrows she has shared and the burdens she has lightened.

Her enjoyment of the beautiful in Nature was especially keen and at her own request, her last resting place on earth is by the lake in the grounds of the home which she so dearly loved.

A deep-seated sense of justice and abslute devotion to duty, characterized her entire life.

She spoke seldom of personal Christianity, but her daily life was a constant preparation for the Life Beyond. Indeed, so filled was she with the idea of Life, that even Death, to her, seemed but to "Open the gates of Life, and make her to rejoice with the saints, in glory everlasting."

EULOGISTIC ADDRESS ON THE LIFE OF C. F. A. BIELBY.

Mr. Westlake: Mr. President, Hon. C. F. A. Bielby, whose name is commemorated in the resolutions, was so eminent, not only as an officer of this Society, but also as a man and citizen, as to deserve from us more than a mere passing notice. I do not claim the right to speak for Mr. Bielby; there are probably others here, who were more intimately associated with him, but as a citizen of Volusia County, I cannot let the opportunity pass to pay some tribute, however inadequate, to his life and character.

Realizing his accountability to his Devine Master and his duty to labor for the good of his fellow men, he devoted himself for some years to the work of the Ministry, and labored successfully in his chosen profession until warned by failing health to desist. Coming to Florida he threw himself with energy and success in the work of building up our industries and advancing the interests of our people, especially in horticultural and agricultural pursuits. Interesting himself in public questions he was honored by the suffrages of his people, and served as a member of the Legislature, first as Representative, then in the high and honorable office of Senator, and there as always, he labored for the good, not of a faction or party or section only, but of the entire State, according to his honest judgment. He had strong political convictions, but was not in a narrow sense a polition, illustrating the adage, that "our men of principle should be our principal men." He was interested in education and every good work, and this was recognized in his appointment as Trustee of one of our State

Colleges, a position that he held at the time of his death.

Mr. Bielby was a man who would have been eminent anywhere and in any time; being a man of magnificent presence, of great natural abilities wide and liberal culture, and above all and crowning all, a high and noble character; and character is the highest thing in all human achievement, towering far above mere gain and wealth and other things that men call success. He was absent from our meeting last year on account of illness, the first time, I think, since the organization of our Society, and soon after passed away from this earthly life to the higher life "beyond the river." He died at the comparatively early age of forty-eight years. Much more good might have been done for his fellow men had he been spared to the allotted period of human life; but though cut off thus early, his life was by no means a failure. A man's life must not be measured by the number of years he lives. One man may live more in fifty years than another would in an hundred.

"All true, whole men succeed; for what is worth
Success 's name, unless it be the thought,
The inward surety to have carried out
A noble purpose to a noble end?"

Judged by this standard the life of our late friend and associate instead of being in any sense a failure, was on the contrary, a full and noble success.

ON THE LIFE OF DUDLEY W. ADAMS.

Mr. Wright: In speaking of the death of a friend and brother it is always sad, but it is a duty which should be performed. Recognizing the fact that has been presented by my horticultural friend on the death of our brother Bielby, who knew him so well—I knew him only as I met him in this Society, I know, however, whoever met him could not fail to respect and honor him. I rise, however, Mr. President and my fellow members of the Society, to say a word in behalf of another, a man whose acquaintance I made twenty-seven years ago, our beloved, dead President, Dudley W. Adams. I learned to know him in the State of Iowa. There his life was devoted to agriculture and horticulture, was devoted to doing good to his fellow men, to elevate their ideas, their standing, their character and the products in which they work. I first learned to know him as Secretary of the State Horticultural Society, of which I was a member. I afterwards knew him at the head of what is known as the Patrons of Husbandry. In 1870 they elected Dudley W. Adams as leader. He acted there as he acted here in the South leading in the work of the country. As a member of the Iowa Legislature at that time, there was great pressure brought to bear on us to pass a law allowing a tax on railroads. Then our State was almost in its infancy. The Legislature thought it best to defer action, and the Committee on Railroads in the House so reported to the Committee appointed by Dudley W. Adams to consult on this subject, and it was postponed until 1872. Again Dudley W. Adams and I met in what is sometimes called the "Third House" in the city of Des Moines where the Legislature was in session, as Master of the Patrons of Husbandry, and they were there one thousand strong, representing every calling, horticultural and agricultural, with Dudley W. Adams at their head. As one of the Committe on Agriculture in the House, I suggested to that Committee we appoint a Special Commit-

tee to consult with the Committee of the Grangers Association, and to suggest to them they present a bill to the Legislature that would be satisfactory, and if not objectionable to the constitution, we would pass it.

Dudley W. Adams formulated what was afterwards known as the great Granger legislation in the State of Iowa, the first law passed in the United States to regulate freight on railroads. He was the author of the bill; it was the first one that had ever been presented. The corporations contested it, said it was unconstitutional, the people had no right to make such laws; it stood the test of all the courts and the Supreme Court of the United States. I speak of that, not as a political question, not whether it was right or wrong, but showing the direction of that man's mind by passing a law, which stood the test of our law without having a precedent to guide him.

Again I met him on this Florida land as a fruit grower and farmer in Florida. I found him working in the same channel I knew in many years he was working in Iowa, and he worked diligently, faithfully, kindly, always the friend of the worker and producer, never swerving from any good, straightforward course; what was honest and right and honorable he was willing to stand up for day and night. Such a man we have lost. It is difficult to replace him. But thank a kind Providence, that rules over the destines of men, we have men that love the memory of Dudley W. Adams, and I thank God I am associated with him.

C. A. Bacon: Please excuse me in not allowing this moment to pass without casting an olive leaf on the grave of our departed President. My heart is full, for I loved that man. His noble life, his busy life is ended. He has crossed over the vale to the transvaal, and in the words of Macbeth: "After life's fitful fever, he sleeps well."

W. S. Hart: I am no orator, yet I cannot feel satisfied to sit here and say not a word at this time in regard to the decease of our late friend Dudley W. Adams, a man that I respected and honored as a man and as the President of this Society, and one whom I dearly loved as a friend. It may be I have been more intimately connected with him in a friendly way for the past twelve or fifteen years than a good many here as we were together a good deal both in our work and in our play. He was in the habit of spending a week or two with me at my home, fishing and hunting each season.

At the time of his death I had been daily expecting a friend from Massachusetts to come down and join me on a three or four weeks' cruise on the Indian River. I had invited Mr. Adams to accompany us, but owing to the delay of my friend I had not sent him notice to come, although I had given him the invitation and he had accepted it and was getting ready to start at once upon receipt of notice. Mrs. Adams wrote me of his preparations for the trip and that he had often spoken of the pleasure in store for him. In accepting the invitation he wrote, "I have done work enough, I now want to go and play."

All the duties of life he met manfully. Whether at work or "play" he did his part and the example that he set was one to help and strengthen those about him of less sturdy make.

Let us hope that for him all hard, tiresome and vexing work is past and that the future offers rest, happiness and recreation.

RESOLUTIONS OF THANKS.

Report of Committee on Final Resolutions.

[SEE MINUTES PAGES 1 TO 5, ITEMS 59 AND 87.]

Votes of thanks were unanimously extended as follows:

TO EX-GOV. HARRISON REED.

For copies of the Semi-Tropical Magazine for distribution among the members and for bound copy of same for the library of the Society.

TO DR. L. MONTGOMERY.

For samples of insecticides for distribution to members of the Society.

FINAL RESOLUTIONS.

Resolved, That the thanks of this Society be and are hereby extended to the newspapers of Orlando for their full and able reports of the proceedings of the sessions of this Society.

Resolved, That the thanks of this Society are due and are hereby tendered to the ladies of Orlando for their kind work of decorating and beautifying the Opera House, and for the many other kind acts shown to us during our stay in this city.

Whereas, Mr. A. H. Manville has by reason of ill health been compelled to resign the office of Secretary of the Florida State Horticultural Society after a service of several years of faithful and earnest work, and

Whereas, it would have been the desire of the Society to have continued Mr. Manville in such position, but for his own personal resignation;

Therefore, Be it Resolved, That the thanks of this Society are due, and are unanimously tendered to Mr. A. H. Mannville for his past valuable services and faithful administration of all matters tending to the benefit of this Society, and

Be it Further Resolved, That the Secretary be requested to forward a copy of these resolutions to said A. H. Manville, and the same be spread on the minutes of this Society.

Resolved, That the thanks of the State Horticultural Society of Florida are hereby tendered to the Passenger Agents of the several railroads of the State for courtesies received in reduced fares, and other favors.

Resolved, That the thanks of the Florida State Horticultural Society are hereby tendered to the Board of Trade and the citizens of Orlando for their handsome reception, and more than courteous and kind treatment received at their hands by this Society.

H. O. W. Margery.
Edward Winter.
Committee on Final Resolutions.

SPECIAL RESOLUTIONS.

[SEE MINUTES PAGES 1 TO 5, ITEM 80.]

TO REV. LYMAN PHELPS.

Prof. H. J. Webber: It has been suggested to me that it would be very proper for us to recognize in some way the services of Mr. Phelps, and the loss the Society has sustained in his absence. I have thus drawn up the following resolutions, which I present herewith:

Whereas, Death in his family and sickness has prevented our highly esteemed brother and member, Rev. Lyman Phelps, from attending this meeting of the Florida State Horticultural Society,

Therefore Be It Resolved, That by the absence of the Rev. Lyman Phelps, the deliberations and discussions of the Society have lost much of their usual interest, and

Resolved Further, That the Society desires to express its sympathy with Mr. Phelps in his affliction, and sincerely hopes for his speedy recovery to health and strength.

CONDEMNING THE PRESENT PRACTICE OF FREE SEED DISTRIBUTION BY THE DEPARTMENT OF AGRICULTURE.

[SEE MINUTES PAGES 1 TO 5, ITEM 74.]

Whereas, The execution of the law providing for the distribution of rare varieties of seeds, plants and trees by the Department of Agriculture of the United States has been perverted from the original intent of the law;

Therefore, Be it Resolved, By the Florida State Horticultural Society, as representing the horticultural and agricultural interests of this State, that we condemn the present practice of general free distribution of the common varieties of vegetable and flower seeds as now conducted by the Agricultural Department.

Resolved, That our representatives in Congress be requested to use their efforts to have the appropriations now made for this purpose applied to the scientific work of the Agricultural Department in investigating diseases and insect enemies of trees and plants grown for commercial purposes throughout the United States, knowing that appropriations thus applied would redound to the benefit of the horticultural and agricultural interests of the country.

Resolved, That the Secretary of this Society be instructed to forward a copy of these resolutions to each of our representatives in the House of Representatives and Senate, and to the Hon. James Wilson, Secretary of Agriculture.

FROM LAKE COUNTY HORTICULTURAL SOCIETY.

[SEE MINUTES PAGES 1 TO 5, ITEM 63.]

Mr. J. B. Price: At our last meeting of the Lake County Horticultural Society, it was the unanimous vote of the members present that we extend greetings to the Florida State Horticultural Society, and the hope that they would be prosperous in all they undertook.

Florida State Horticultural Society.

Catalogue of Fruits.

1897.

THE FLORIDA STATE HORTICULTURAL SOCIETY'S

CATALOGUE OF FRUITS

AS REVISED BY THE EXECUTIVE COMMITTEE

ACCORDING TO THE NOMENCLATURE COMMITTEE'S PLAN OF CLASSIFICATION, AND ADOPTED BY THE SOCIETY AS THE OFFICIAL CATALOGUE AT THE TENTH ANNUAL MEETING AT ORLANDO, FLORIDA.

PLAN OF CATALOGUE.

In making a complete Catalogue of the Fruits of Florida, indicating intelligibly in summarized and tabular form, the relative value of varieties for different sections, the wide-stretching territory, diversity of soil and climate, and the limited range of each of the numerous fruits, render it essential that the State be divided, so that regions allied throughout in their adaptability to fruits may be designated and referred to.

To this end, four districts have been formed, as described below. Geographical lines cannot be made to indicate pomological conditions with accuracy. More than approximate correctness could not be expected from an arbitrary division of this kind, especially where local conditions vary so greatly as in Florida. Working by general averages, some sections are unavoidably left in the wrong districts, judging by the standard of local conditions. The divisions, however, will be found to answer their purpose as well, or better, than any that could be made without further sub-divisions, which would be impracticable.

WESTERN NORTH FLORIDA—That portion of the State west of the Aucilla river.

EASTERN NORTH FLORIDA—That portion of the State between the Aucilla river and a straight line drawn across the State from the mouth of the St. Johns river to Cedar Keys.

CENTRAL FLORIDA—That portion of the State between the line above referred to and the counties constituting Southern Florida.

SOUTHERN FLORIDA—The counties of Brevard, Dade, Monroe, Lee, DeSoto and Manatee.

EXPLANATION OF ABBREVIATIONS.

The abbreviations and signs used in the columns which appear in the ensuing pages explain as follows:

ORIGIN—Of variety or species. (Refers to species, race, or geographical derivation, as best calculated to define)
- A., American.
- E., English
- E. I., East Indies
- F, Foreign.
- H., Hybrid
- J., Japanese
- N, Native of Florida.
- O., Oriental.
- S. A., South America.
- W. I., West Indies.

ORIGIN—(Referring to oranges only)

The origin of oranges is given to conform as nearly as possible to the preponderance of influence evidenced of the particular strain or its probable wild ancestry: *Sev.*, Sweet Seville or Sweet China; *St. M.*, St Michael or Portugal; *Mal.*, Malta Bloods, their progeny and kindred; *Man.*, the Mandarin, or Citrus Aurantium Nobilis varieties.

ORIGIN—(Referring to peaches only).
- H., Honey race
- N. C, North Chinese race.
- N. O. B. New Oriental Bloods.
- Per., Persian race
- P-to, Peen-to race.
- S., Spanish race.

ORIGIN—(Referring to grapes only).
- A., Aestivalis.
- L., Labrusca.
- R., Riparia.
- V., Vulpina

SEX--Of variety. (Referring to strawberries only).
- B., Bisexual.
- P., Pistillate

USE—Of fruits.
- d., Dessert, eaten without culinary preparation.
- c., Culinary, including drinks, confections, condiments and domestic and manufactured preparations for gustatory use.
- s., Shipping, for general market; good long-distance carrier.
- n., Near-by market only. (Because of restricted demand or poor carrying qualities.)
- a., All purposes named above.
- w., Wine. (Referring to grapes only.)

SIZE—Of fruit.
- l., Large
- m, Medium.
- s., Small.
- v., Very.

FORM—Of fruit
- b., Blunt (obtuse).
- c., Conical
- e., Eliptical.
- f., Flattened (oblate).
- h., Heart-shaped (cordate).
- k., Kidney-shaped (reniform).
- l., Lemon-shaped.
- o., Ovate.
- ob., Obovate.
- ol., Oblong.
- p., Pyriform.
- pt., Pointed apex.
- q., Quarter-marked.
- r., Round.

FORM—Of bunch (applies to grapes only).
- br., Broad.
- cl., Cylindrical.
- cp., Compact.
- sh., Shouldered

COLOR—Of fruit except as to peaches, where it refers to flesh. Use adjective or noun according to application Thus r. stands for "red" or "reddish"; r. y., "reddish-yellow"; r and y. "red and yellow" (as a yellow fruit with red cheek or other red markings).
- b., Black.
- bl., Blue
- br., Brown.
- bz., Bronze.
- c., Crimson
- cr., Carmine.
- d., Dark.
- g., Green.
- l., Light.
- o., Orange (not a shade of red, but the color of ripe oranges).
- p., Purple.
- r., Red
- s., Salmon.
- sc., Scarlet
- v., Violet.
- w., White
- y., Yellow.

CLASS—Of fruit
- C. Clingstone.
- F., Freestone

QUALITY—Of fruit.
b.. Best.
f., Fair.
g., Good.
v., Very.

FLESH—Of fruit (applies to strawberries only).
f., Firm.
m., Medium.
s.. Soft.

SEASON—Of ripening of fruit.
E.. Early.
Ev.. Everbearing.
F., Fall
L.. Late.
M., Medium.
S, Summer
Sp. Spring
V. Very.
W., Winter.
(V. E., "very early"; L. M., "late medium", etc.)

VIGOR—Of tree, vine or plant.
g., Good grower.
m., Moderate grower.
v., Vigorous grower.

PROLIFICNESS—Of tree, vine or plant.
f Fair bearer
g. Good bearer
p. Prolific.
s. Shy
v. Very

ADAPTABILITY—Of variety or species to region named.

(*) One star—Recommended for region named.

(**) Two stars—Especially well adapted and desirable.

(†) A dagger—New, recently introduced, or but little known, and promising

(—) A dash—Not adapted or found undesirable.

( ) Blank space—No mark or sign in "Adaptability" column indicates that no report has been made.

CITRUS FRUITS.

ORANGES—(*Citrus aurantium*).

NOTE.—The development of orange culture in this State has given rise to a multiplicity of varieties, many of which, while meritorious, have no distinctive qualities, or superiority as compared with others. It is impracticable to avoid this duplication by cutting down the list, which would exclude many desirable kinds that have been extensively planted, or about which there is demand for information. To avoid the confusion of a long list embracing many kinds without distinctive differences, the plan of using two kinds of type has been resorted to.

The names in heavy type are designed to constitute a complete list for the State embracing varieties of the highest excellence in all the desired characteristics of season, quality, distinctiveness, productiveness, etc. The names in light type are those whose characteristics are possessed in an equal or superior degree by other varieties which appear in heavy type. Some varieties in light type equal others in heavy type having the same characteristics but where there is a difference it is in favor of the varieties in heavy type. In cases of equal excellence, the best known has the preference. So that the varieties in heavy type as a whole, and without disparagement to other excellent sorts, may be said to embrace the leading kinds for general culture.

New, or comparatively unknown varieties also appear in light type; but for this distinction see "Adaptability" column.

NOTE.—In referring to the time of ripening in the column headed "Season", "very early" applies to varieties marketed in September and October; "early", to October and November varieties; "early medium", November and December; "medium", December, January and February; "late medium", February and March; "late", March and April; "very late", April, May and later.

NOTE—The region of orange production proper extends southward from Central Florida, overlapping the upper portion of Southern Florida. Therefore, under "Adaptability" below the varieties have been starred for "Southern Florida"; here, however, the starring applies more particularly to the upper portion of the district.

(*See "EXPLANATION OF ABBREVIATION", on page iii.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
SWEET ORANGES — *Citrus aurantium dulcis.*													
1 Acapulco	St M	d s	l	r	o	g	M	g	p	—	—	*	*
2 Acis	St M	d s	l	r	o	g g	L	v	p	—	—	*	*
3 Amory Blood	Mal	d s	m	r	o r	g	E M	v	p	—	—	*	*
4 Beach No 5	St M	d s	l	e	o r	g	L M	g	p	—	—	*	*
5 **Bessie**	St M	d s			o	g	L			—	—	*	**
6 Boone *(Boone's Early)*	Mal	d s		r	l o		V E			—	†	†	*
7 Botelha	St M	d s	m	r	o	g	M	g g	g	—	—	*	*
8 Brazilian	St M	d s	m	r	o	v g	L		g	—	—	*	*
9 **Centennial**	St M	d s	m	r	o	b	E M	v	p	—	—	*	*
10 Charley Brown	St M	d s	l	f	o	g	M			—	—	*	*
11 China *(Mandarin)*	Man	d s	m	s	l o	g				—	—	*	*
12 Circassian	St M	d s	s m	r	o	v g	M	g	g	—	—	*	*
13 Colmar *(Sanford's Sweet Blood)*	Mal	d s	m	r f	o r	v g	E M			—	—	*	*
14 Cunningham	St M	d s	m		o	v g	E M	g	g	—	—	*	*
15 Drake Star	St M	d s	l	r	o	g	M	v		—	—	*	*
16 **Double Imperial Navel**	St M	d s	m	e	o	v g	M	g g	s	—	—	*	*
17 Dulcissima	St M	d s	s	r	o	v g	E	g	g	—	*	*	•
18 Dummit	St M	d s	l		o	g	M	v	p	—	—	*	*
19 **Du Roi**	St M	d s	m	r	o	g	L M	v	p	—	—	**	*
20 **Early Oblong** *St. Michael Egg)*	Sev	d s	m	e	o	f	V E	g	p	—	*	*	*
21 **Enterprise Seedless** *(Starke Seedless)*	Sev	d s	m	r	o	v g	E	g	v g	—	*	**	*
22 Exquisite	St M	d s	m	r	o	v g	M	g g	p	—	—	*	*
23 Fortuna	Mal	d s	m	r f	o	v g	M	g g	v p	—	*	*	*
24 Foster	St M	d s	m	r	o	g	E	g	p	—	*	*	••
25 **Harts Late** *(Tardive, Brown, Excelsior)*	St M	d s	m	e	o	g	V L	v	p	—	—	**	••
26 **Higley Late**	St M	d s	m	r	o	g	L	v	p	—	—	**	••
27 **Homosassa**	Sev	d s	m	r	o	v g	M	v	p	—	—	**	*
28 **Imperial Blood**	Mal	d s	m	r	o r	v g	E			—	—	*	**
29 **Jaffa**	Mal	d s	m	r	o	b	M	g	p	—	—	**	*
30 Jaffa Blood	Mal	d s	s	e	o r	b	M	g	p	—	—	**	*
31 King	Man												
32 Knickerbocker Blood	Mal	d s	m	r	o r	v g	M		p	—	—	†	†
33 Lamb Summer	St M	d s		e	o		V L			—	—	*	*
34 Long *(Sanford's Oblong)*	Mal	d s	m	o	o	g	M	g	p	—	—	†	†
35 Madam Vinous	St M	d s	m	r	o	b	M	v		—	—	**	*
36 Magnum Bonum	St M	d s	l	r	o	v g	M	v	g	—	—	*	*
37 **Majorca**	Mal	d s	m	r	o	b	L M	v	p	—	—	**	••
38 **Maltese Blood**	Mal	d s	s	e	o r	b	M			—	—	*	*
39 Maltese Egg	Mal	d s	s m	o	o	v g	M	g	p	—	—	*	*
40 **Maltese Oval** *(Garey Med. Sweet)*	Mal	d s	l	e	o	v g	L	g	p	—	—	**	**
41 Mays	St M	d s	m	r	o	v g	M	g	g	—	—	*	*
42 MediterraneanSweet *(Sanford's)*	St M	d s	l	e	o	v g	L	m	p	—	—	*	*
43 Melitensis Navel	Sev	d s	l	r e	o	v g	E	g	f	—	†	†	†
44 Mikado	Man		m	f	o	g	V E	g	p	—	*	*	•
45 **Nonpareil**	Sev	d s	l	r	o	b	E M	v	p	—	*	**	•
46 **Old Vini** *(Beach No. 2)*	Sev	d s	m	r	o	v g	M	v	p	—	—	*	*
47 **Paper Rind**	St M	d s	s	e	l o	g	L M	g	v p	—	—	*	*

ORANGES—Continued.

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Southern Florida.	Central Florida.
48 **Parson Brown**	St M	d s	m	e	o	g	E	v	p	—	*	**	*
49 Peerless	St M	d s	m	r	o	v g	M	v	p	—	—	*	*
50 **Pineapple**	St M	d s				v g	M	v	p	—	—	*	*
51 Prata	Mal	d s	s	r	l o	g	M	g	g	—	—	*	*
52 Prolific	St M	d s	m	r	o	v g	M	g	v p	—	—	†	†
53 **Sanguinea** (*Ruby, DuRoi Blood*)	Mal	d s	m	r	o r	v g	E M	g	p	—	*	*	*
54 **Satsuma**	Man	d s	m	f	o	v g	V E	g	v p	—	—	**	*
55 St. Michael	St M	d s	m	r	o	g	M	g	p	—	—	*	*
56 **St. Michael Blood**	Mal	d s	m	r	o	b	M	g	p	—	—	*	*
57 Sauls Blood	Mal	d s	m	f	o r	v g	M	g	p	—	†	†	†
58 Star Calyx	St M	d s	l	r	o	g	M	g	g	—	—	*	*
59 **Sweet Seville** (*Sanford's Sweet Seville*)	Sev	d s	s	r	o	g	V E	v	p	—	*	*	*
60 Tangerine (*Dancy, Cowgill, Morgagne*)	Man	d s	lm	f		v g	M	g	v p	—	—	**	*
61 Tangerona	Man	d s	s	r	o r	g	V E	v	p		*	*	*
62 Tephi	Mal	d s	m	r	o	v g	M	v p	p		*	*	*
63 Thorpe (*Trophy*)	Sev	d s	m	r	o	g	V E			—	*	**	*
64 Valencia Late	Mal	d s	l	e	l o	g	L	g	p	—	—	*	**
65 **Washington Navel**	Sev	d s	l	r e	o	b	E M	g	s	—	*	*	*
66 White	Val	d s	l	r	l o	g	M	g	p	—	—	†	†
67 Whittaker	Sev	d s	m	r	o	v g	M	v	v p	—	—	*	*
BITTER ORANGES — *Citrus Aurantium Bigaradia*													
68 **Bitter Sweet**	N	d c	l	r f	d o					—	*	*	*
69 Dwarf	F	c	l	r f	d o					—	*	*	*
70 Italian Sour	F	c	l							—	?	?	?
71 Navel	F	c	l							—	?	?	?
72 **Phillips Bitter Sweet**	N	d c	l	r f	d o					—	*	**	*
73 Sour	N	c	l	r f	d o					—	*	*	*

REMARKS—On varieties as numbered above: Nos. 21 and 48, desirable early sorts: 15, 47, 58 and 63, distinct; 16, native of Louisiana; 19, distinctly corrugated, desirable; 25 and 31, ver desirable late sorts; 26, 27, 29, 37, 45 and 50, desirable; 60, a market favorite; 54, a favorite in early market; 68 and 72, very refreshing in summer; 73, refreshing acid; 7, 12, 17, 19, 20, 38, 51, 52, 55 58 and 66 came from Thomas Rivers, of England, the well-known nurseryman.

OF ORANGES, the leading fruit crop of the State, and great staple of the Central region, over five million boxes were produced in the season of 1894-95.

THE NAVEL VARIETIES are much esteemed on account of the delicate texture and superior quality of their fruit. They are usually shy bearers, although experience indicates that they are much more prolific upon "rough" lemon and trifoliata stocks than, as generally grown, upon orange stocks.

THE BLOOD VARIETIES are sweet, and therefore marketable, early in season, as indicated by the abbreviations in the "Season" column. At this time their distinctive character is not apparent, and they have little advantage in market over other early sorts. As the season advances, their ruby tints develop, until quite apparent on the exterior, and their quality continues to improve until, at full ripeness, they are equaled by few and surpassed by none. In locations sufficiently exempt from frost to permit their being held on the trees until they reach perfection, they bring high prices and are exceptionally profitable.

THE SATSUMA is valued on account of its hardiness, which is increased by being grafted upon the entirely hardy Trifoliata stock. As it is marketed before cold weather (it ripens very early), it is much planted in sections north of the usual range of oranges.

OTHER VARIETIES.—Excluding the Navels, Bloods and Satsuma, noted above, and without disparagement to other sorts of equal merit, the following are suggested as a desirable list for general planting, arranged in order of succession: *Very Early*, Boone, Sweet Seville; *Early*, Enterprise Seedless, Parson Brown; *Early Medium*, Nonpareil, Centennial; *Medium*, Pineapple, Jaffa, Homosassa; *Late Medium*, Majorca, Du Roi; *Late*, Bessie, King, Maltese Oval; *Very Late*, Hart's Late

Varieties distinctly marked in their exterior appearance, like the Navels, Bloods, Du Roi, etc., are, other things being equal, most desirable for market

POMELOS—Grape Fruit (*Citrus Pomelanus*) and Shaddocks (*Citrus Decumana*).

(*See "EXPLANATION OF ABBREVIATIONS", on page iii.*

NAMES (*Varieties*).	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Aurantium	N	d s	l m	r	l y	g	L M	v	v p	—	—	**	*
2 Blood Shaddock	F		l	r	l o	f		v		—	—	**	*
3 "Forbidden Fruit"	F									—	—	**	*
4 Hart	N	d s	l	r	l y	v g	L M	v	v p	—	—	**	*
5 Josselyn	N	d s	l	r	l y	g	L M	v	v p	—	—	**	*
6 Mammoth (or Orange) Shaddock	F		l	r	l o	f		v		—	—	**	*
7 Seedless										—	—	†	†
8 Triumph	N	d s	s m	r	l y	v g	L M	v	v p	—	—	**	*
9 Walter	N	d s	l m	r	l y	g	L M	v		—	—	**	*

THE POMELO.—Growing the Pomelo for market is a comparatively recent development, but considerable quantities are now shipped, and its culture is rapidly extending. It has proved popular in the general market, and its culture profitable. Its range of adaptability is about the same as the orange. Most of the older trees were planted before named varieties were introduced The above list comprises the leading kinds now generally planted.

LEMONS—(*Citrus Limonum*).

(*See "EXPLANATION OF ABBREVIATIONS", on page iii.*)

NAMES (*Varieties*).	Origin.	DESCRIPTION. Fruit. Use	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Belair	F	c s	m	bl	l y	b	F	v	v p	—	—	*	**
2 Genoa (*Eureka*)	F	c s	m	l	l y	g	F	v	v p	—	—	*	**
3 Imperial (*Messina*)		c s	m	l	y	g	F	v	v p			*	**
4 Sicily (*Sanford's Thornless*)	F	c s	m	l	l y	b	F	v	v p	—	—	*	**
5 V illaFranca	F	c s	m	l	l y	b	F	v	v p	—	—	*	**

THE LEMON.—Lemon growing in Florida is an industry of some importance, the crop of 1894 being estimated at 150,000 boxes. The tree stands less cold than the orange, and planting is confined to lower latitudes and locations of comparative frost exemption. The foregoing varieties are highly esteemed and generally planted.

MINOR CITRUS FRUITS.

(*See "EXPLANATION OF ABBREVIATIONS," on page iii.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
KUMQUATS-Kin Kans(*Citrus Japonica*)													
1 Marumi	F	d c s	s	r	o			m	p	—	*	**	*
2 Nagami	F	d c s	s	o	o			m	p	—	*	**	*
LIMES (*Citrus limetta*).													
3 Mexican	F	c s	m	l	l y	v g		v	v p	—	—	*	**
4 Persian	F	c s	m		l y					—	—	*	**
5 Tahiti	F	c s		l	l y	v g				—	—	*	**
CITRONS (*Citrus medica*)													
6 Lyman	F	c	m	l	oy	g				—	—	**	**
7 Lemon	F	c	l	l	oy	g				—	—	**	**
8 Orange	F	c	s	r	oy	f				—	—	**	**
9 BERGAMOTS (*Citrus bergamium*)										—	—	*	
10 OTAHEITES *Citrus sinensis*)										*	*	*	*
11 TRIFOLIATAS *Citrus trifoliata*)										*	*	*	*

REMARKS.—On varieties and species as numbered above: No. 9, grown as an ornamental, yields an essential oil; 10, grown as an ornamental, and as a stock for dwarfing—fruit valueless; 11, a hardy species, grown as ornamental, extensively used as stock and for hedges—fruit valueless.

DECIDUOUS FRUITS

PEACHES—(*Persica Vulgaris*).

NOTE.—The time of ripeniug of any particular variety varies considerably, in Florida, as elsewhere, according to season and locality. Under head of "Season," "very early" means April 20 to June 15; "early," from June 1 to July 15; "medium," from July 1 to August 10; "late," from August 1 to September 20; "very late," from September 10 to November 1.

NOTE—"Color," as applied to peaches, refers to the flesh, and not to the exterior, as with other fruits

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES (*Varieties*).	Origin.	DESCRIPTION. Fruit. Use.	Size.	Class.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Alexander	Per	d s	m	F	w	f	V E	g	f	**	—	—	—
2 Amelia	Per	d e n	l	F	w r	b	E	g	f	*	*	—	—
3 Angel	P-to	d s	l	F	w	b	E	v	v p	*	**	**	**
4 Bidwell's Early	P-to	d s	m	C	w	g	V E	g	p	—	*	**	**
5 Bidwell's Late	P-to	d s	l	C	w	g	E	v	v p		**	**	**
6 Cabler's Indian	S	d e n	l	C	r	g	M	g	f	**	*	—	—
7 Chinese Cling	N C	d n	l	C	w	g	M	g	f	*	—	—	—
8 Chinese Free	N C	d n	l	F	w	g	M	g	f	*	—	—	—
9 Climax	H	d s	m	F	w	g	E	g	p	*	*	—	—
10 Colon	H	d s	m	F	w r	v g	E	g	p	†	**	†	—
11 Columbia	S	d e n	l	F	y	g	M	g	f	*	—	—	—
12 Countess	S	d n	l	F	w	g	M	v	p	**	*	*	†
13 Crawfords Early	Per	d s	l	F	y	b	E	g	f	*	—	—	—
14 Early Cream	H	d s	m	F	w	g	E	g	p	**	**	*	—
15 Elberta	N C	a	l	F	y	b	M	g	p	**	—	—	—
16 Ferdinand	H	d s	m	C	w r	b	E	g	p	†	**	†	—
17 Fleitas (Yellow St. John)	Per	d s	l	F	y	g	E	g	f	†	—	—	—
18 Florida Crawford	S	d e n	l	F	y	b	M	g	f	**	*	*	—
19 Foster	Per	d s	l	F	y		E		f	†	—	—	—
20 General Lee	N C	a	l	C	w	g	M	g	t	**	*	—	—
21 Gibbons October	S	d n	l	F	w	g	V L	g	f	**	*	*	—
22 Honey	H	a	m	F	w	g	E	g	v p	*	**	*	
23 Imperial	H	a	l	F	w	v g	E	g	p	**	**	*	
24 Japan Dwarf Blood	NOB	d s	m	F	r	f	V E	m	f	*	*	†	
25 Jessie Kerr	Per	d s	m	F	w	f	V E	g	f	**	—	—	—
26 Jewel	P-to	d s	m	F	w	g	V E	g	p	—	†	—	
27 La Magnifique	S	d e n	m	C	w	g	L	g	g	*	*	†	
28 La Reine	S	d e n	m	C	w	g	M	g	g	*	*	†	
29 Maggie	P-to	d s	m	C	w	g	V E	g	g	—	*	**	**
30 Mountain Rose	Per	d s	m	F	w	b	E	g	f	*	—	—	—
31 Onderdonk	S	d e n	m	F	y	g	M	g	f	*	*	—	—
32 Oviedo	H	a	l	F	w	v g	E	g	p	†	**	†	—
33 Pallas	H	d s	m	F	w	g	E	m	f	*	*	—	—
34 Peen-to	P-to	a	m	F	w	g	V E	v	v p	—	*	**	**
35 Powers September	S	d n	m	F	w	g	V L	g	f	**	*	*	—

PEACHES—Continued.

NAMES *Varieties.*	Origin.	DESCRIPTION. Fruit. Use.	Size.	Class.	Color.	Quality.	Season.	Tree or Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
36 Red Ceylon	NOB	c	m	F	r	g	V E	g	p	—	—	*	*
37 Reeves Mammoth	S	d c n	m	F	w	g g	M	g g	f	*	*	*	—
38 Sneed	N C	d s	m	C	y	g g	V E	g g	g	**		—	—
39 Taber	H	d s	m	C	w r	b	E	g g	p	†	**	†	
40 Thurber	N C	d c n	l	F	w	g	M	g g	f	*	*		—
41 Triana	H	d s	m	F	w r	g g	E	g g	p	†	**	†	
42 Victoria	S	d c n	l	F	y	g g	L	g g	f	**	*	*	
43 Waldo	P-to	d s	m	F	w	g	V E	g g	p	—	**	**	*
44 Yum Yum	P-to	d s	m	C	w	g	V E	g g	g	—	*	**	**

Remarks—No 6, a fine blood peach; 25, much like Alexander in tree and fruit, preferred to the latter by many; 26, a new variety, seedling of Waldo, introduced by T. K Godbey and claimed by him to ripen two weeks earlier than Waldo, although blooming at same time; 3 and 43 bloom a month later than any other varieties of the Peen-to race (except Jewel)—hence especially desirable where late frosts occur; 34, flat, like a tomato; all the other varieties listed are of standard peach shape; 36, not a dessert peach, but especially desirable for cooking.

The Peach is successfully grown in localities throughout the greater portion of the State, and in the Central and Northern districts is extensively produced for shipment to Northern markets. As a rule, for this purpose, only those varieties are grown which are marked "early" and "very early" in the above table, and which come in before the general crop farther north To this there are some exceptions, notably in Western North Florida where some mid-season varieties like Elberta, are successfully grown for shipment.

While the list of peaches grown in the State embraces many varieties, the various sections covering a wide range of latitude and longitude, differ to such an extent in soil, climate and conditions of local environment, that the varieties adapted to a particular region are comparatively limited in number. A first and vital essential to successful peach production is the adaptability of variety to locality; in general this is true of peaches to a greater extent than other fruits, and especially so in Florida.

THE BEST VARIETIES.

Lower Central and Southern Districts.—For very early market, Bidwell's Early, Maggie, Peen-to, Waldo, Yum Yum; for early market, Angel, Bidwell's Late. The foregoing are all of the tropical Peen-to race. Red Ceylon, also a tropical peach, is well adapted. For succession for home use, try varieties of Honey and Spanish races starred for lowest ranges, which do fairly well in localities.

Upper Central District.—For very early and early market, the same varieties recommended for Lower Central and Southern Districts, except that for early market, in many localities the following varieties of Honey race should be added: Colon, Ferdinand, Early Cream, Honey, Imperial Oviedo Taber, Triana. Some of the Spanish varieties succeed, such as Countess, Florida Crawford, Gibbon's October, La Magnifique, La Reine, Power's September, Reeves Mammoth, Victoria.

Eastern North Florida.—For very early market, Waldo, and perhaps Jewel; for early market, Angel, Bidwell's Late, and the varieties of Honey race named above Here (with the exception of the new Jewel) of the Peen-to race only Bidwell's Late and the late-bloomers Angel and Waldo are

retained. These and the above-named varieties of Honey and Spanish races are well adapted; other Honey and Spanish varieties do well, but the above are the leading sorts. Some varieties of Northern Chinese race do fairly well in localities.

WESTERN NORTH FLORIDA.—Far very early market, Alexander and Jessie Kerr; for early market, the Honey varieties named above, to which add Pallas and Climax. For mid-season market Elberta, General Lee and Thurber. Alexander, Jessie Kerr and General Lee are quite extensively grown, but Elberta is the leading peach. Here the Peen-to varieties are discarded. Like the Honey varieties, the Spanish varieties do well. Most varieties of Northern Chinese race and some Persians including those named and others, are well adapted. Great hopes are entertained of the recently imported Japan Dwarf Blood, which is the first of all to ripen, but it is of fair quality only, and a moderate grower.

PLUMS—(*Prunus*).

NOTE.—"J," as used in "Origin" column, means that the variety belongs to the Japanese class (*P. Triflora*) but not necessarily imported from Japan.

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES (*Varieties*).	Origin.	DESCRIPTION.									Adaptability.			
		FRUIT.							TREE.					
		Use.	Size.	Form.	Color.	Class.	Quality.	Season.	Vigor.	Prolificness.	Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Abundance	J	a	l m	r p t	y&r	C	g	E	v	p	*	*		
2 Babcock	J	a	l	r p t	r	C	g	M	v	p	*	**		
3 Bailey	J	a	l	r	o&r	C	g	E			†	†		
4 Botan	J	a	l m	r c	y&r	C	g	E	v	p	*	**		
5 Burbank	J	a	l m	r	r&y	C	b	E	v	p	**	**		
6 Chabot	J	a	l	e c	l r	C	g	M			*	*		
7 Excelsior	J H	a	m	r	r p	C	b	V E	v	p	*	*		
8 Golden Beauty	A	a	m	r	y	C	g	L			*	†		
9 Kelsey	J	a	v l	h	g y	F	g	L	v	p	*	*		
10 Normand	J	a	l m	b c	y	F	g	E			†	†		
11 Pissard	?	c	m	r	p r	C	g	E	v	s	*	*	*	
12 Red Nagate	J	a	l m	e c	r p	C	g	V E			†	†		
13 Wild Goose	A	a	m	r	r	C	g	E			*	—	—	—
14 Willard	J	a	l m	r	d r	F	g	V E			†	†		
15 Yellow Japan	J	a	l	r	y&r	C	g	M			*	*		

REMARKS.—No. 4, well known and widely planted throughout the Lower South, where it is one of the best; introduced by P. J. Berckmans in 1886 as Botan; it has been sold under the names Sweet Botan, Yellow Fleshed Botan, Abundance and Berckmans, but it is doubtful if any of these names are properly applied to this variety. No. 7, seedling of Kelsey, supposed to be crossed with Cumberland or Wild Goose. No. 11, a handsome ornamental; fruit and foliage blood red.

PLUMS.—While plum growing has not attained commercial importance in this State, the recent introduction of the Japanese varieties, many of which seem well suited to sections of Upper Florida, has led to the general planting of this fruit. So far as tested, Burbank, Babcock, Botan and Kelsey have proved most desirable.

PEARS—(*Pyrus communis*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES *Varieties.*	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree or Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Bartlett	E	a	l	b p	y	v g	E	m	f	*	—	—	—
2 Garber	O	a	l	rbp	y&r	g	M	v		†	†	†	—
3 Jefferson		s					V E	g		*	†	—	—
4 Kieffer	O	a	v l	rbp	y&r	g	V L	v	v p	**	**	*	†
5 Lawson							V E	m	f	*	—	—	—
6 Le Conte	O	a	l	olbp	g	g	E	v	v p	**	**	*	†
7 Smith	O	a	l	e p	g	g	E	v	p	**	**	*	

Remarks,—No. 3, very early, showy; 4, desirable for late market; 6, 7, desirable for early market.

Pears.—Pear culture has developed into a considerable industry in the Northern and Northwestern regions of the State. The LeConte and Keiffer are planted almost exclusively, the former largely predominating. Smith promises to rival LeConte as an early variety for general planting, having some advantages over the latter, perhaps in quality and earliness, and being equally vigorous and productive. For general market the three varieties named give much better results than other sorts.

Stocks.—It is essential to success with pears in this State, that they be propagated upon LeConte or Japan pear stock.

GRAPES—(*Vitis—Labrusca, Æstavalis, Vulpina, etc.*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES (*Varieties*).	Origin.	DESCRIPTION. Fruit. Use.	Bunch. Size.	Bunch. Form.	Berry. Size.	Berry. Form.	Color.	Quality.	Season.	Vine. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Concord	L	dnw	l	s h	l	r	b	g	M	g	f	*	*	*	
2 Cynthiana	A	d w	m	shcp	s	r	b	v g	L	v	f	**	**	**	*
3 Delaware	H?	a	s	shcp	s	r	r	b	M	g	p	*	*	*	
4 Diamond	L	d s	m	shcp	m	r	w	g	V E	v	p	—	*	*	—
5 Elvira	RH	w	s	c p	m	r	w	g	M	g	p	*	*	*	—
6 Flowers	V	dnw	s	r	v l	e	b	f	V L	v	p	**	**	**	*
7 Goethe	H	d n	m		v l	e	w	v g	L	v	p		*	*	
8 Herbemont	A	d w	m	shcp	s	r	b	v g	L	v	p	—	*	*	*
9 Ives	A	s w	m	c p	m	r e	b	f	V E	v	p	**	**	*	*
10 Niagara	L	d s	l	c p	m	r	w	g	V E	v	p	—	**	**	*
11 Norton	A	d w	m	shcp	s	r	b	g	L	v	f	**	**	**	—
12 Salem	H	d n	m	shcp	l	r	r	v g	M	v	f	—	*	*	—
13 Scuppernong	V	dnw	s	r	v l	r	bzw	g	V L	v	v p	**	**	**	**
14 Surprise	?	d n	l	c l	v l	r e	rb	v g	M	v	f	—	*	*	—
15 Thomas	V	dnw	s	r	v l	r	rb	g	V L	v	v p	**	**	**	**
16 Wilder	H	d n	l	b r	v l	r	b	v g	M	v	f		*	*	

REMARKS.—Numbers 6, 13, 15, entirely free from fungus diseases; 2, 9, 11, almost free from fungus diseases: 1, 3, 4, 5, 10 subject to fungus diseases in wet seasons; 8, 12, 14, 16, subject to fungus diseases: 8, stars apply especially to the East Coast.

GRAPES.—In many locations throughout the State varieties (as indicated by the starring above) succeed well, and are quite extensively grown for shipment to Northern markets as well as for local consumption and the manufacture of wine.

FOR MARKET.—Delaware, Niagara, and Ives (only) have proved a success as shipping grapes for distant markets (when properly packed). Diamond, on account of its compactness and tendency to crack, does not stand long shipment.

FOR RED WINE.—Cynthiana, Norton and Ives are the red-wine grapes of Florida, as they are the red-wine grapes of the United States. Eepecially is this true of the first two named; their juice is dark and rich in saccharine matter, and the wine made from these two grapes is said to possess great medicinal properties, owing to its large percentage of tannin. From Thomas, a red wine of a special character can be made, which finds many admirers in the South.

FOR WHITE WINE.—Elvira, Delaware and Niagara are, among the varieties above named, the best grapes for white wine—especially dry wine. It is from Elvira that the famous San Louis Sauternes are made, which have established the reputation Florida wines. Delaware is better adapted to the manufactuar of sweet wine, and from Niagara a good dry wine can be made much superior to the article made from Northern grown Niagaras, our Florida Niagaras being almost entirely free from that foxy taste so prominent in all Northern Labruscas.

THE MUSCATINE VARIETIES.—Flowers, Scuppernong and Thomas belong to this class, which is very distinct from the other grapes named They are prodigious growers and bearers, a popular dessert and wine fruit in the south, but are not grown for Northern market

EUROPEAN VARIETIES (*V. vinifera*) have finally proved an entire failure—even with those who, for a few years, seemed to have succeeded in growing them

OTHER VARIETIES. Besides the varieties described in the list above, other varieties may do well in particular localities or favored locations, and may be satisfactorily grown for family use, but varieties not included in th s Catalogue should not be attempted on a large scale until their value has been demonstrated by experiment.

KAKI—Japanese Persimmon—(*Diospyros Kaki.*)

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES (*Varieties.*)	Origin.	DESCRIPTION.								Adaptability.			
		Fruit.						Tree.					
		Use.	Size.	Form.	Color.	Quality.	Season.	Vigor.	Prolificness.	Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Costata	J	d s	m	rept	s r	g	L	v	p	**	**	**	*
2 Hachiya	J	d s	v l	obpt	b r	f	E	g	s	*	*	*	*
3 Hyakume	J	d s	l	rfob	o r	g	M	v	p	**	**	**	*
4 Okame	J	d s	l	r f g	b cr	v g	E&M	v	v p	**	**	**	*
5 Tabers No. 129	J	d s	m	rpt	o r	g	V E	v	p	**	**	**	*
6 Tane-nashi	J	d s	l	rept	l r	b	M	g	g	**	**	**	*
7 Tsuru	J	d s	l	olpt	b r	g	VL	v	v p	**	**	**	*
8 Yeddo-ichi	J	d s	m	r f	d r	v g	M	g	g	**	**	**	*
9 Yemon	J	d s	l	r f g	o&r	v g	M	v	p	**	**	**	*
10 Zengi	J	d s	s	r f	d r	g	V E	v	v p	*	*	*	*

THE KAKI succeeds well throughout the State, and is generally, though not extensively, grown. For market, this delicious fruit has the merit of shipping well and keeping long. While new markets are often reluctant to take hold of it, wherever known it sells well.

NOMENCLATURE.—While there has been much confusion in regard to the names of varieties, the above kinds are now as well known as the leading varieties of other fruits; they embrace the most valuable kinds, and the names as given are correctly applied.

CHARACTERISTICS.—Some of the varieties have dark flesh, others light flesh, still others a mixture of the two. The light and dark flesh differ radically in texture and consistency as well as appearance, and when found in the same fruit are never blended but always distinct. The dark flesh is never astringent; the light flesh is astringent until it softens. The dark-fleshed fruit is crisp and meaty, like an apple, and is edible before it matures. Some of the entirely dark-fleshed kinds improve as they soften, like Hyakume and Yeddo-ichi; others are best when still hard, like Zengi and Taber's No. 129. As they are good to eat before they are ripe, it is not so important that the dark-fleshed kinds be allowed to reach a certain stage before being offered to consumers unfamiliar with the fruit. The light-fleshed kinds, and those with mixed light and dark flesh, are very delicious when they reach the custard-like consistency of full ripeness. In some the astringency disappears as the fruit begins to soften, as with Yemon, and in a less degree with Okame and Tane-nashi; in others it persists until the fruit is full ripe, as with Tsuru. The light-fleshed kinds should not be offered to consumers unacquainted with the fruit until in condition to be eaten. A person who has attempted to eat one of them when green and "puckery" will not be quick to repeat the experiment. Seeds accompany the dark flesh. The light-fleshed kinds are seedless. The kinds with mixed flesh have seeds in proportion to the quantity of dark flesh. Hyakume, Zengi and Hachiya are usually overspread at the blossom end with penciling or net-work of dark lines, and this sometimes occurs in other kinds.

VARIETIES.—Tane-nashi, Okame, Yemon and Yeddo-ichi excel in quality, perhaps in the order named. Okame (on account of the difficulty of getting the fruits all in the same stage of ripeness) and Hachiya are not as good shippers as the others; the latter is valued for its immense size and showiness. Okame, on account of its long season, exquisite beauty, and superior quality, is the best for home use and local market. Zengi and Taber's No. 129 are valued for their earliness, as are Tsuru and Costata for their lateness. Costata is very distinct and handsome in both tree and fruit. Hyakume is most generally grown of the dark-fleshed kinds. Tane-Nashi is, perhaps, most highly esteemed in market.

STOCK.—The Kaki should be grafted on the native persimmon, on which it is much more satisfactory than upon its own or imported stocks.

MINOR DECIDUOUS FRUITS.

(*See "EXPLANTION OF ABBREVIATINS," on page iv.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
APPLES—*Pyrus malus.*													
1 Jennings	N ?	d n	l	f	g	g	E	v	p	*	*	†	—
2 Red Astrachan	F	d n	l	r	r	g	E			*			
APRICOTS—*Armeniaca vulgaris.*													
3 Santa Fe	N	d n	m	r f	y&r	g	V E	v		*	x	†	
FIGS—*Ficus carica.*													
4 Black Ischia	F	d e n	m		b	g	S				*	*	
5 Blue Genoa	F	d e n	m		b l	g	S	m			*	*	
6 Brown Turkey	F	d e n	m		b r	b	S	m	g		*	*	
7 Brunswick	F	d e n	l		v b r	g	S	v	v p		*	*	
8 Celestial	F	d e n	s		p v	b	S	v	v p	*	*	*	
9 Green Ischia	F	d e n	m		g	g	S	v			*	*	
10 Lemon	F	d e n	m		y	g	S	v	v p		*	*	
11 White Marseilles	F	d e n	m		y w	g	S	v	v p		*	*	

MINOR DECIDUOUS FRUITS—Continued.

NAMES (*Varieties.*)	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
MULBERRIES—*Morus nigra.*													
12 Downing	A		m	ol	b	g	E	v	s	*	*		
13 Hicks	A		m	ol	b	f	E&L	v	v p	*	*	*	*
14 Stubbs	A		l	ol	b	g	M	v	p	*	*	*	*
15 Late (?)	A		m	ol	rb	b	L	v	p	*	*	*	*
POMEGRANATES—*Punica granatum.*													
16 Acid		d	l	r	ry		F	v	p	*	*	*	*
17 Purple		d	l	r	ry	b	F	v	p	*	*	*	*
18 Sweet		d	l	r	ry	g	F	v	p	*	*	*	*

REMARKS.—Nos. 1 and 2, home use; 3, freestone, home use; 12, unsatisfactory bearer; 13, enormously productive; 14 and 15, superior quality acid; 17, most desirable.

APPLES AND APRICOTS—Are not recommended for general culture, although the varieties named give fair results in the home orchard in the regions indicated.

THE FIG—A most delicious fruit for the table and culinary use, thrives everywhere. It is not grown for shipment, but is one of the most valuable and generally grown home-use-and-local-market fruits. All the varieties named are desirable.

MULBERRIES—Are well adapted to all sections. They are largely grown for swine, poultry, and as a toll for birds; and, by some, the more acid kinds are esteemed for table use.

THE POMEGRANATE—An agreeable fruit, desirable for occasional use, and especially valuable as an ornamental shrub or tree, is not grown for market, but most plantations have a few trees.

NUTS.

(*See "EXPLANTION OF ABBREVIATIONS," on page iv.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Quality.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
CHESTNUTS—*Castanae.*										
Chincapin (*C. pumila*)	A	d n	s	v g	v	p	*	*	*	†
Japan Chestnut (*C. Japonica*)	F	d c s	v l	g	v	g	*	*		

NUTS—Continued.

NAMES (*Varieties*).	Origin.	DESCRIPTION. Fruit. Use.	Size.	Quality.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
PECANS—*Carya olivæformis.*										
3 Paper Shell	A	d s	l	b	v	p	**	*	*	
WALNUTS—*Juglans.*										
4 Japan Walnut (*J. Seiboldi*)	F	d	m	b	v		†	†	†	†

NUTS.—The Pecan has been long grown in the State in a small way; it flourishes in many localities, and its culture is profitable. The Japan Chestnut, of comparatively recent introduction, has, so far, proved well adapted. The Japan Walnut, of still more recent introduction, promises well; it is certainly the most desirable of the Juglans in this State.

MISCELLANEOUS FRUITS.

STRAWBERRIES—(*Fragaria*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES *Varieties*.	Origin.	DESCRIPTION. Fruit. Sex.	Use.	Size.	Form.	Color.	Quality.	Flesh.	Season.	Plant. Vigor.	Productiveness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Cloud		P	a	l	bo	d c	f	m	E & L	v	p	**	**	*	
2 Federal Point		B	d n				g	m		v	p		*	*	
3 Hoffman	A	B	s	m	c	d c	f	f	VE	m	f	*	*	*	
4 Lady Thompson .		B	s	l	o	c	f	f	E	m	p	*	*		
5 Michel		B	d n	l	b c	y r	b	s	VE	v	p	*	*		
6 Newnan		B	a	m	o	c	f	f	E & L	m	p	**	**	**	
7 Wilson		B	a	m	o	d c	g	f	E & L	m	p	**	**	*	

REMARKS.—No. 2, highly prized for home use; not recommended for shipping.

STRAWBERRIES—Are extensively grown in sections of the upper portion of the State, for Northern markets. The Newnan and Wilson have been found most desirable for shipping. The Hoffman and Cloud are also raised to some extent for this purpose.

MINOR MISCELLANEOUS FRUITS.

(See "EXPLANATION OF ABBREVIATIONS," on page iv.)

NAMES (*Varieties*).	Origin.	DESCRIPTION. Fruit. Use	Size.	Form.	Color.	Quality.	Season.	Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
BLACKBERRIES—*Rubus villosus*.....	A	d n								*	*		
DEWBERRIES—*Rubus canadensis*.....	A	d n								*	*	*	
LOQUATS—*Eriobotra Japonica*.....	F	d n	m	e	y	v g	Sp	v	p	*	*	**	
OLIVES—*Oleo Europea*	F	c s	s	e	r b		F	v	p	*	*	*	
SURINAM CHERRY (*Eugenia Michelii*).	E I	d e	s	r		y						*	*

DEWBERRIES, also BLACKBERRIES in some varieties succeed admirably in the regions indicated, but are not cultivated to any considerable extent, owing to the abundance of native, wild berries.

LOQUAT.—Are quite generally grown in a small way for home consumption. They are a very desirable fruit for table, as well as culinary use. At present the Loquat is propagated from seed, and the fruit varies greatly in size and quality. Improved varieties should be originated and disseminated.

OLIVES.—Do well. Many trees have been planted, and there are some old groves. The varieties, of which there are many, are not sufficiently known in this State to catalogue.

THE SURINAM CHERRY.—A delicious acid fruit—is grown to a limited extent, for home use.

TROPICAL FRUITS.

PINEAPPLES—(*Ananas Sativa.*)

(See "EXPLANATION OF ABBREVIATIONS," on page iv.)

NAMES	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Abachi (Abakka).....	F	d e	m	o l		b	S			—	—	—	
2 Black Antigua	F	d e	l	o l	d	b	S S			—	—	—	
3 Black Jamaica	F	d e	l	o l	dy	b	S S			—	—	Require protection.	* * *
4 Black Prince	F	d e	l	e		b	S			—	—	—	†

PINEAPPLES—Continued.

NAMES (*Varieties.*)	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida. Require protection.	Southern Florida.
5 Blood	F	d e	m			g	S			—	—		†
6 Crown Prince	F	d e	l	e		b	S			—	—		†
7 Charlotte Rothschild	F	d e	m	e		b	S			—	—		†
8 Egyptian Queen	F	d e	m	e	y	b	S	v	p	—	—		**
9 Lady Beatrice	F	d e	l	e		b	S			—	—		†
10 Lord Carrington	F	d e	l	e		b	S			—	—		†
11 Mammoth Kew	F	d e	v l			b	S			—	—		†
12 Prince Albert	F	d e	l	e		b	S			—	—		†
13 Porto Rico	F	d e	v l	r	y	g	S S			—	—		**
14 Red Spanish	F	d e s	m	r	r y	f	S S	v	v p	—	—		**
15 Ripley Queen	F	d e	m	e	y	b	S			—	—		**
16 Smooth Cayenne	F	d e	l	e		g	S S			—	—		*
17 Sugar Loaf	F	d e	m	e	y	b	S S			—	—		*
18 Trinidad	F	d e	l	e	y	b	S			—	—		†
19 White Antigua	F	d e	m	o l	l	b	S			—	—		†

PINEAPPLE CULTURE.—Is one of the most extensive fruit-growing industries in the State.

VARIETIES.—The Red Spanish is the variety generally grown for market; it is also known as 'Black Spanish," "Scarlet Key," "Largo," "Havana," "Cuban," "Strawberry," etc. The Egyptian Queen is also planted, to some extent, for market.

BANANAS (*Musa*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Southern Florida.	Central Florida.
1 Baracoa (*Red Jamaica*)	W I	d s	l		r	g		v	p	—	—	—	**
2 Cavendish	E I	d s	m		y	b		v	p	—	—	—	**
3 Golden (*Tahiti?*)	W I	d n	l		y	g		v	p	—	—	—	**
4 Harts Choice	W I	d n	s		y	b		v	p	—	—	—	**
5 Magnifera	W I	d s	l		r	g		v	p	—	—	*	†
6 Orinoco (*"Horse Banana"*)	S A	d e n	l		y	f		v	p	—	—	*	**

REMARKS—On varieties as numbered above. Nos. 1, 2 and 3, general market; 4 and 6, home use.

COMMERCIAL BANANA CULTURE is confined to the extreme lower portions of the peninsular.

VARIETIES.—The Baracoa is the ordinary Red Banana of commerce. The Cavendish (*M. Cavendishii*) is a dwarf species, also known as "Dwarf," "Dwarf Jamaica," "Chinese," "Martinique." Except the Orinaco, Hart's Choice has a more northern range than the other sorts. The Orinoco matures further north than any other variety, it is an ordinary plantain (*M. Paradisica sapientum*) as distinguished from the Banana or Sweet Plantain (of which Barocoa and Golden are varieties); when allowed to ripen on the plant, it is of good quality, and desirable for home use, in sections too far north for other kinds.

GUAVAS—(*Psidium*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES (*Varieties.*)	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Common Guava (*P. Guaiava*) — many unnamed varieties ...	W I	d e n					S&F	v	v p	—	—	*	**
2 White Winter (*P. Guaiava*)	W I	d e n	m	p	g	g	F	v	p	—	—	*	**
3 Cattley (*P. Cattleyanum*)	A	c n	s	r	r	g	S&F	v	p		*	**	**
4 Chinese (*P. Lucidum*)		c n	s	r	y	g	S&F	v	p		*	**	**

REMARKS.—On varieties as numbered above. No. 2, distinct and desirable; 3 and 4, hardy.

THE GUAVA is quite extensively grown in Central and Southern Florida for home use, local market and the manufacture of jelly. It is a most delicious fruit for dessert, as well as cooking and preserving. There are numerous varieties, as yet unclassified. The hardy kinds, Cattley and Chinese, have about the same range as oranges.

MANGOES—(*Mangifera Indica*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES, (*Varieties.*)	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Common (the ordinary sort) ..	E I	d e n	l	k	y&r	g	S	v	p	—	—	*	*
2 Apricot	W I	d e n	m	k	r&y	v g	S	v	p	—	—	*	**
3 No. 11 (*Apple*)	W I	d e n	l	r	y	v g	S	v	p	—	—	*	**

MANGOES—Are very generally grown in Tropical Florida for home consumption, local market, and to some extent for shipment. Many new sorts, of probable superiority, have been introduced in recent years, but have not been sufficiently tested to be catalogued.

COCOANUTS—(*Cocos nucifera*).

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
Seedlings.....	F	d c s	l	r	br	b	Ev	v	p	—	—	—	**

Extensive COCOANUT plantations are to be found on the southern coast. Little or no attention has been paid to varieties.

MINOR TROPICAL FRUITS.

(*See "EXPLANATION OF ABBREVIATIONS," on page iv.*)

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree or Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
1 Avocado Pear (*Persea gratissima*	W I	d c s	l	p	y&b r	g	S & F	v	p	—	—	—	**
2 Cherimoya (*Anona cherimolia*	SA	d n	l	e	br y	g	S	v	p	—	—	—	**
3 Custard Apple *Anona reticulata)*	W I	d c	l	c	g	g	S	v		—	—	—	*
4 Granadilla *Passiflora edulis* ..	W I	d c	m	r	l r	g	S	v		—	—	*	*
5 Hog Plum (*Spondius lutea*	W I	d	s	r	g	b	S	v		—	—	—	*
6 Jamaica Sorrel *Hibiscus sabdiriffa*).....	E I	c	m		r		F	v	p	*	*	**	**
7 Mammee Apple *Mammea Americana*).....	W I	d s	l	r	br	g	S			—	—	—	*
8 Mammee Sapota *Lucuma mammosa*)... ... :.....	W I	d s	l	e	y	g	S			—	—	—	*
9 Otaheite Gooseberry *Cicca disticha*	W I	c	s	r	w	g		v	p	—	—	—	*

MINOR TROPICAL FRUITS—Continued.

NAMES.	Origin.	DESCRIPTION. Fruit. Use.	Size.	Form.	Color.	Quality.	Season.	Tree or Plant. Vigor.	Prolificness.	Adaptability. Western North Fla.	Eastern North Fla.	Central Florida.	Southern Florida.
10 Pawpaw (*Carica papaya*).....	E&WI	d c n	l	e	y	f	Ev	v	p	—	—	—	**
11 Rose Apple (*Eugenia jambos*)	EI	d c	m	r	l	f	Sp&-	v	p	—	—	—	**
12 Sapodilla (*Achras sapota*)	WI	d s	m	r	br	g	Ev	v	p	—	—	—	**
13 Sour Sop (*Anona muricata*)....	WI	c	l	c	g	g	S	v	p	—	—	—	*
14 Spanish Lime (*Melicocca bijuga*)	WI	d	s	r	g	g	S	v	p	—	—	—	**
15 Star Apple (*Chrysophllum cainito*)	WI	d	m	r	g	g	S p	v	p	—	—	—	*
16 Sugar Apple (*Anona squamosa*)	WI	d c	m	c	g	g	S&F	v	p	—	—	*	**
17 Tamarind (*Tamarindus Indicus*)	EI	d s	sm	pod	br	f	Ev	v	p	—	—	—	**

REMARKS. On species as numbered above: Nos. 1, 7, 12 and 17, sell well in general market; 2, 3 and 16, much admired in the tropics; 5, delicious; 6 and 9, desirable for cooking; 13 and 17, esteemed for acid drink; 4, 6, 9 and 11, especially fine for jelly.

THE MINOR TROPICAL FRUITS. Listed above are none of them raised for market on a large scale, but all are desirable, and are extensively grown, over a more or less extended area, in the more tropical regions of the State, a number being produced in considerable quantities for local market or consumption. A few, like the Mammee Apple, Sapodilla and Avocado Pear, ship well and find ready sale; the Avocado Pear has brought good prices in the New York market. Some, like the foregoing, the Star Apple and the Hog Plum, are agreeable to most palates upon first acquaintance; others, like the Sugar Apple, Cherimoya, and Sour Sop, which are much esteemed by those accustomed to the fruit, require an acquired taste to be appreciated. A number are grown for home use, almost or quite exclusively, either because too tender for transportation, like the Sugar Apple and Pawpaw, or for their value for culinary purposes; of the latter, the Otaheite Gooseberry is a valuable acid fruit for cooking and preserving; the Jamaica Sorrel is not a fruit, in the proper sense, but produces a pulpy calyx, which makes an excellent substitute for cranberries; the acid Sour Sop is used for flavoring, preparing drinks, etc., and is much esteemed in sickness. The Tamarind bears a pod with a pleasant acid pulp which, preserved in sugar, finds ready sale in the general market.

FLORIDA STATE HORTICULTURAL SOCIETY.

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